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THE UNIVERSITY OF ALBERTA

Sex-differences in second-language learning: personality variables.

by

© Atken Armenian

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF EDUCATION.

DEPARTMENT OF Educational Psychology

EDMONTON , ALBERTA
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THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled ...Sex differences in second-language learning: personality variables.....

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in partial fulfilment of the requirements for the degree of

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ABSTRACT

Sex-differences in personality variables and in aptitudes for second-language learning are examined in this thesis. In the teaching experience of the investigator, girls have shown a consistent superiority over boys in second-language learning. Other language teachers have informed the investigator that they share this opinion.

Seventy-six boys and 61 girls at the Grade six level of a public school in Alberta, Canada, were asked to take the Junior Eysenck Personality Inventory (JEPI) and the Modern Language Aptitude Test - Elementary (EMLAT). The JEPI measured the Ss' extraversion, neuroticism, and the Ss' tendency towards lying. The EMLAT consisted of subtests which measured the ability to associate sounds and symbols, sensitivity to grammatical structure, the ability to hear speech sounds, auditory alertness and the ability to memorise.

The data were subjected to a one- and two-way analyses of variance to determine whether the differences between the sexes on the various measures were statistically significant. In this study, $p < .15$ was selected as the basis for accepting or rejecting the null hypothesis.

Girls were found to have significantly higher scores on the lie scale of the JEPI ($p < .01$). Girls were also significantly better at perceiving syntax ($p < .04$) and speech sounds ($p < .05$). Extraverts of both sexes showed a trend towards higher scores for sound-symbol association ability ($p < .14$) and also for the ability to hear speech sounds ($p < .11$). A sex-lying interaction on the subtest measuring sensitivity to grammatical structure was also apparent ($p < .11$) on the two-way analysis of variance.

Since sensitivity to syntax and to sound discrimination

is important in learning a second language, the girls' better performance in these tests may partially explain their observed greater ability in learning a second language. Furthermore, as may be inferred from the lie-scale and its contents, the students' concepts of socially acceptable behaviour play an important role in second language learning.

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CHAPTER I

THE PROBLEM

INTRODUCTION

The investigator taught French for a period of four years to public school children ranging in age from ten to fifteen. During that time, he was impressed by the superiority of girls over boys in the field of second-language learning. Informal discussions on the subject with colleagues have confirmed this observation.

The superiority of girls over boys in general verbal tasks is acknowledged by a number of modern psychologists. Thorpe (1946), for instance, states that even among newborn babies, girls not only vocalise more frequently, but that their voacalisation also tends to be more complex and develops more rapidly than that of boys. Anastasi and Foley (1956) report the superiority of girls in such specific fields as linguistic functions, memory, articulation and verbal intelligence. Tyler (1965) contrasts the adult achievement of girls with their school achievement. The earlier onset of maturation in girls is forwarded as a possible explanation for some of these differences in achievement. It is pointed out, however, that the variability of scores within each sex group must be taken into account when considering the variability between the groups. Terman and Tyler (1966) generalise their research by indicating the superior school achievement of girls, especially in language oriented material. Boys tended to do better in science and mathematics.

Moreover, these texts refer to the general agreement among psychologists on the greater emotional instability of girls. Within the framework of personality variables for each sex, it has been the

investigator's observation that boys are generally more extraverted than girls. In the previously mentioned writing of Terman and Tyler, girls are reported to show a greater sense of social desire than boys and are more inhibited in their social participation. This inhibition is attributed by the authors to the introvertive tendencies found in girls. This is significant for the present study when one considers Hall's (1951) opinion on the matter:

> In foreign language teaching, it has been observed that the learner feels that adherence to his own speech patterns is almost a matter of morals ... the linguistic super-ego ... gives rise to psychological blockings ... particularly in the case of extraverts (p. 26).

The reason for this is that the new language is perceived by the extravert as a tool external to the user and is therefore futile and silly; but the introvert regards language as a personal way of living and acting. Morgan (1953), on the other hand, dwells on the "non-intellectual" factors that influence the acquisition of a second language: attitudes, maturation, motivation, age, energy potential, rigidity of thinking, perseverence, and capacity to make new adjustments, among other things. These data were found to have a greater predictive efficiency than the group testing approach which was also carried out with the same sample.

The present study will deal with sex differences in the relationship of certain personality factors and second-language aptitudes.

NEED FOR THE STUDY

The question of the differences between the sexes is of unabating interest to psychologists and the public at large. For better or worse, human society has assigned different roles to the two

sexes. These roles may or may not be related to any inherent differences between the two groups; but any psychological description of a trait not common to both may offer us some ideas as to the make-up of these differences.

The study is needed to explain further the nature of second-language acquisition. With the general improvement in the technology of bringing people and ideas closer together, it is important to know if and how people are to cope with this closer contact with one another. Learning a second language is the most obvious manifestation of the willingness to seriously understand a different nationality.

This study was undertaken in an attempt to contribute to the existing knowledge of personality as applied to second language learning. It has always been intriguing to the investigator that the difference in success in learning a second language between North America and Europe is as great as the difference in the personalities of these two groups of people. The study, therefore, is a personal need to find out if any relationship can be scientifically proven to exist between personality and second language learning.

Statistics compiled by the Government of the Province of Alberta (1974) show steadily decreasing numbers of students enrolled in second language programs in Alberta schools. This study will hopefully provide some clues as to the reasons for this trend by bringing out any data which may be useful in curriculum development. Scagliola (1971) has already shown that sex-differences must be taken into account in the choice of texts to be used in schools.

PURPOSE OF THE STUDY

The purpose of the study is to determine whether there are any sex differences in personality traits, and whether such personality traits have any bearing on a person's aptitude to learn a second language.

STATEMENT OF THE PROBLEM

The problem to be considered in this study is the identification of specific factors associated with the observed superiority of girls over boys in the field of second language learning. These reasons are to be investigated within the framework of personality variables such as extraversion, neuroticism and lying.

DEFINITION OF TERMS

Second-language aptitude

This term refers to the capacity of a person to learn successfully a foreign language. This capacity is an unlearned feature of that person (Carroll and Sapon, 1959).

Extraversion

Extraversion is characterised by sociability, activity, optimism, out-going and impulsive behaviour (Eysenck, 1963).

Introversion

Introversion is characterised by unsociable, passive, quiet, thoughtful and reserved behaviour (Eysenck, 1963).

Neuroticism

This is the state which characterises an unstable person. Such a person is moody, touchy, usually restless and rigid (Eysenck, 1963).

Stable

The stable person, unlike the neurotic, is calm, carefree,

easy-going, and reliable (Eysenck, 1963).

Lying

This will be taken to mean the process of deliberately and dishonestly falsifying the truth. It can also mean better and priggish behaviour; as such, it is not a mere faking phenomenon (Eysenck and Eysenck, 1963, and Semeonoff, 1968).

Personality

Eysenck (1960) defines personality as "the more or less stable and enduring organisation of a person's character, temperament, intellect, and physique, which determines his unique adjustment to the environment (p. 2)."

DESIGN OF THE STUDY

The sample consists of 76 boys and 61 girls of a school in the suburbs of Edmonton. These numbers represent the total population of Grade Six students of that particular school.

The sample was given the Junior Eysenck Personality Inventory to measure their extraversion, neuroticism and tendency to fake.

The sample's language aptitude was measured by the Modern Language Aptitude Test - Elementary. Besides giving a total score, four components were also measured. These components define particular areas which may have relevance in the aptitude for second-language learning.

ASSUMPTIONS

For the purpose of this study, it is assumed that:

1. Paper-and-pencil tests can and do measure personality traits and aptitudes.

2. The sample was of sufficient academic maturity to under-

stand the items contained in the measures.

3. The measures are accurate not only in what they measure but also in the way they measure for each subject.

DELIMITATIONS

The present study is delimited in the following ways:

1. The sample was taken from one school only. The socio-economic status of the sample, therefore, excludes students who are in any way different because of the neighbourhood in which they live. The study cannot be generalised to a population of children who come, say, from a wider range of background variables.

2. The sample was taken from one grade only. The study does not take into account any differences which may exist in other age groups.

3. The study is delimited by the theories held by the authors of the tests used. Other tests which claim to measure similar variables (e. g. Pimsleur's Language Aptitude Battery and Cattell's 16 PF) may provide different data (Cattell and Cattell, 1969, and Pimsleur, 1966).

LIMITATIONS

The investigator recognises the following points:

1. It is very hard to answer questions on a subject as complex as personality simply by a "yes" or a "no", as is the case with the Junior Eysenck Personality Inventory. Much detail is lost when the subject is confined in this way.

2. No longitudinal study was carried out for this project. All results, therefore, are limited by the time-factor involved. Similarly, the validity of the measures was not checked for the present sample.

HYPOTHESES

The statistical analysis of the results will be directed towards the following null hypotheses:

1. There is no significant difference between boys and girls for extraversion.

2. There is no significant difference between boys and girls for neuroticism.

3. There is no significant difference between boys and girls for lying.

4. There is no significant difference between boys and girls for second-language aptitudes.

5. There is no significant difference between boys and girls for extraversion and second-language aptitudes.

6. There is no significant difference between boys and girls for neuroticism and second-language aptitudes.

7. There is no significant difference between boys and girls for lying and second-language aptitudes.

OVERVIEW OF THE REPORT

The first chapter has dealt with the background to the problem and has presented an outline of the ways in which the researcher will proceed to find some answers to the questions raised to this point. The next chapter will look at the work of others in this field. Chapter III will describe the mechanics of the data collection process. It will also include the statistical work which was carried out. Chapter IV looks at the results and presents tables and figures which provide the basis for the rejection or acceptance of the original null hypotheses. The final chapter will summarise the findings and provide

some guidelines on the applicability of this study to the classroom and to any further research in this field.

CHAPTER II

REVIEW OF THE RELEVANT LITERATURE

SEX DIFFERENCES

The most recent work of major importance in the field of sex differences lists 474 references (Garai and Scheinfeld, 1968). This review will only deal with those sex differences that are especially important in the field of verbal cognitive abilities.

Of 113 studies conducted from 1925 to 1965 and listed by Maccoby (1966), 62 demonstrated the superiority of girls in various verbal skills. This compares with 14 such studies which reported a superiority of boys when compared to girls. Twenty seven studies found no difference at all between the sexes. These studies dealt with such topics as reading, spelling, grammar, vocabulary, length of statement, verbosity and verbal fluency, articulation, age of first speech and other general verbal skills.

The origin of these differences is discussed by Hamburg and Lunde (1966). Experiments with infrahuman mammals have shown that excess androgen produced during the development of the fetus leads to "striking permanent effects on later behaviour (p. 10)." Whether such effects are applicable to human beings cannot be firmly established because of the lack of evidence. The possibility exists, however, that "exessive amounts of androgen may act on the developing reproductive tract and brain to produce masculinizing effects (p. 10)." In this article, Diamond (1965) is quoted to believe that "human beings are definitely predisposed at birth to a male or female gender orientation (p. 17)." Furthermore, Beach (1965) is also quoted as having reached the conclusion that "it is at least conceivable that there are sex

differences in the functional characteristics of the male and female brain, that such differences are manifested at birth...(p. 17)."
The study by Watson (1969) would tend to confirm the hypothesis of sex differences which occur prior to any socialisation of the child. In this study, girls were found to be more interested in faces of people and vocalised more than the boys when presented with a stimulus. In their operant conditioning, girls learnt more when the reward was auditory whereas boys learnt more when the reward was visual. Could this be a prelude to the more personal orientation in life which females manifest (Tyler, 1965)? Could it also be the basis of the generally accepted fact of the superiority of girls in such fields as verbal fluency and language development (Garai and Scheinfeld, 1968)? The investigator feels that it may well be the case. This is not to deny the obvious effects which other factors may have on the accentuation and consolidation of these sex differences.

Differences in the rate of maturation of each sex may be one of the processes which further increase the trends considered here. Pauly (1951) has found that girls are mentally more mature than boys by about two months at the grade two level, and that by the grade eight level this advantage is increased to eight months. The other factor which undoubtedly increases the original differences in sex for language skills is the effect of society. Barry, Bacon and Child (1957) found that girls were never given any training in self-reliance in the 82 cultures which they studied. Obedience and nurturance were commonly taught for girls. Insofar as such a practice encourages boys to be more independent and individualistic, one could assume that this would make girls even more aware of social conventions and thereby increase

their consciousness of language. This awareness was studied by Smith (1933) who found that girls were more interested in social rules and conventional ways of applying labels to objects. McDavid (1959) also found that girls tended to carry out their tasks by imitating adult models whereas boys were more independent. These studies were replicated in a more recent study by Brindli et. al. (1972). The Kuder Preference Record has shown that women are more interested in interpersonal relations and that men have a tendency towards impersonal relationships (Schutz and Baker, 1962).

If their genetic advantage and greater socialisation are not enough to ensure the superiority of girls in verbal tasks, then the school, as a system, favours the girls in terms of grades (Sears and Feldman, 1966), in spite of the fact that girls are more frequently rebuked by their teachers for lack of knowledge (Spaulding, 1963).

More specific studies exist in abundance to show the special fields in which girls are better than boys. In their review, Darley and Winitz (1961), concluded that girls talk sooner by two to six weeks. Stuttering and other language disorders are two to four times more frequent in boys and boys need the help available in reading clinics four times more frequently than girls do (Bentzen, 1966 and Bennett, 1938). Terman and Lima (1926) found that in the lower grades, girls read twenty to thirty percent more books than boys. The subjects of these books usually deal with such topics as family life, children, and the home. Boys, on the other hand, read books on travel, crime, adventure, exploration and mystery. Some conclusions may be inferred as to the appropriateness of some of the topics most commonly found in second-language courses as was demonstrated by Scagliola (1971).

PERSONALITY THEORY

The review of the writings on this topic will be limited to the issues in Eysenck's field of interest.

In terms of approach, Eysenck (1970) traces the tradition of his ideas to Hippocrates and Galen who enunciated the four temperaments of man: the melancholic, the choleric, the sanguine and the phlegmatic. Kant and Wundt are described by Eysenck as the forefathers of his theory of personality. Adcock (1965) deals with the positions of Eysenck and Cattell: the apparent leaders in the field of personality measurement. The differences between the two stem mainly from their divergent methods of factor analysis. Eysenck prefers less precise measures obtainable from second order factors. On the other hand, Cattell identified twelve factors accounting for forty percent of the variance and later added another four. The question arises as to the practical use which a precise description of an imprecise concept (such as personality) can be put in, say, the classroom environment. Furthermore Eysenck (1960) makes the following statement:

> Cattell's fifteen factors are not independent, and the intercorrelations in turn require to be submitted to factor analytic studies. These have been undertaken by Cattell (1957) and their publication, as he points out, "yields two very striking findings - the general integration factor, and the introversion/extraversion factor".... Cattell's studies line up ... to define the same two personality factors we have encountered so often (p. 137).

The extraversion and neuroticism factors, therefore, seem to account for a reasonably satisfactory number of personality traits. If one were to refer to the original scheme of personality as proposed by Galen, Kant and Wundt, we would obtain the following description of the four basic types in Eysenckian terms:melancholics are unstable

introverts, phlegmatics are stable introverts, sanguines are stable extraverts, and cholerics are unstable extraverts (Eysenck, 1969). The validity of these descriptions is demonstrated by the fact that research evidence on the Eysenck Personality Inventory, from which the JEPI is derived, has established some criteria for various groups of the general population as follows: prisoners are choleric, alcoholics are melancholics, managers are phlegmatic and salesmen are sanguine (Educational and Industrial Testing Service, no date).

Of greater relevance to this thesis, is the amount of work which has been done with children in the area of learning. Rachman (1969) shows the essential unity of the structure of personality from childhood to adulthood. The main conclusions which emerge from his writing are that activity and rapidity in infancy are related to extraversion in adulthood and childhood. Boys tend to obtain lower neuroticism scores when compared to girls and also boys are more aggressive (and possibly more extraverted) than girls. Eysenck (1969) in discussing the JEPI found these trends confirmed in her analysis. Her previous work with adults (1960) had found women to be generally more neurotic and introverted than men.

Some studies have been carried out which might link these sex differences in personality to an actual learning situation. Eysenck (1970) states:

> ...reminiscence is due to consolidation of the memory trace; that this consolidation is a direct function of cortical arousal; and that hence introverts would show better memory, and greater reminiscence, in the long run...while consolidation is going on, it interferes with performance which accordingly suffers; hence in the short run extraverts will show better memory and greater reminiscence (p. 468, vol. 3).

This hypothesis was partially tested by McLaughlin and Eysenck (1967) and Farley (1970). Extraverts not only learnt faster, but were also better at learning more difficult tasks. Their reminiscence scores were also higher.

The results obtained in a laboratory, however, can be quite misleading when applied to a real life situation. Vildomec (1963) states that open-minded and receptive (extraverted) children absorb a second-language with greater ease than shy, self-centered and meditative (introverted) children. A conflicting report is given by Lynn (1959) and Child (1964) who found that introverts were generally better in their academic careers. Savage (1966) also found that the graphical relationship of neuroticism and performance was in the shape of an inverted "U". This non-linearity would explain the usual low relationship found between these two factors using a linear modal such as the Spearman correlation factor. The cultural validity of these studies were confirmed in a study by Kline (1966) on Ghanaian University students. Some caution should be exercised, however, because although sociological parameters may be different for British and Ghanaian university students, the academic system in both countries is similar. Such caution may be inferred from the study of Terman (1925) as quoted in Lynn (1959). In this study, Terman is reported to have found that highly talented young Americans are better adjusted than the normal population. University selection practices may be introducing a bias in these investigations - a bias which could well be negating the effects of a different social setting. This may well be a field of further research as the relevant literature reviewed by the investigator did not show any contributions made in this specific field.

SECOND-LANGUAGE LEARNING

The bibliographies of Haugen (1956), Weinreich (1963), Vernon Jensen (1962) and Vildomec (1963) deal with a broad range of topics in the field of second-language studies. The present review will not repeat the work done by these authors but will rather concentrate on some of the more recent studies which have a more direct bearing on this thesis.

Buxbaum (1949) reports on the use of a second-language by some of her patients in order to repress unwanted feelings which had occured in the first language. The super-ego was, in a way, weakened as a result of this compulsive switch to the new language. The topic of attitudes and second-language learning has received much attention in the works of Gardner and Lambert (Gardner, 1973a, 1973b, 1973c, 1973d; Lambert, Gardner, Barik, Tunstall, 1963; Gardner and Lambert, 1972). These studies emphasise the importance of motivation and attitudes. The integrative motive, whereby the student's "goal in learning a second language is to communicate with, interact with, or generally form some sort of social attachement with members of the second language community (p. 2, 1973d)," is of greater importance than his instrumental motive. The reason is that the instrumental motive is a goal-achieving motive (e. g. studying French to get into University) and as such, is not as effective in getting the student to learn the second-language. It is unfortunate that no reference is made in these studies to any specific analysis of data on the basis of any sex-differences. One can hypothesise the results of such a study, however, from Johnstone's (1965) work. English-speaking girls were found to have a greater commitment to bilingualism in Canada when compared to their male counterparts.

Unfortunately, the relationship between Johnstone's "commitment"(1965) and Gardner's "integrative motivation" (1973d) must await confirmation by further research.

Pimsleur, Mosberg and Morrison (1962) have reviewed the work done on student factors in foreign language learning. As would be expected, the reports agree that intelligence correlates with achievement in learning a foreign language. Spoerl's study (1939), which is also mentioned in the review, has shown that females obtain a higher correlation than males on the intelligence-achievement correlation. Of lesser importance in terms of significant correlation is the relationship of verbal ability and success in learning a foreign language. Several studies have shown, however, that the components of verbal ability may sometimes show positive correlations in this field. Graham (1968) reports that memory is used in the planning (or syntax) of the new language. Lado (1965) reports that digit and general memory span was shorter for a subject tested in his second language as compared to his native tongue. The memory span increased with greater proficiency in the second language. The question of memory span is crucial to the acquisition of the primary matter of the new language - the building blocks of a second-language learner's secondary matter (Politzer, 1965). The actual mechanisms of this transfer are outlined with reference to the acquisition of the second-language's grammar in a study by Titone (1965). He regards grammar learning as something which is gradually absorbed, almost unconsciously, by the student. In fact, he goes so far as to say that grammar can only be learnt after knowing the language. Brown and Bellugi (1964) found three complementary ways in the child's acquisition of syntax. The first involved the reduction of the mother's (the model

of the child) speech to a kind of adult telegraphic language. To use the authors' terms, the speech contained no functors - only contentives were used to convey the barest essential meaning of the utterance. This reduction involved a feed-back system whereby the mother would take the child's statement and expand it using functors to "fill in" the gaps of the child's telegraphic statement. This procedure gave the child an immediate corrective model of speech to listen to. These two processes involve only a basic ability to imitate sounds in a certain sequence. The third procedure is much more complex in that it requires that the child generalise his past linguistic experience to come up with an original sequence of words without the benefit of simply imitating a previously acquired structure. The authors refer to this as induction of the latent structure. Obviously it is a more advanced stage in the linguistic development of the child. Although the subjects were both observed in the process of learning their native tongue, one could infer from the work of Imedadze (1960) that, for young children, no significant differences or difficulties would arise if we were looking at a language other than the native one. The investigator's children, aged six and three, have very naturally and, almost spontaneously, developed to be trilingual and bilingual respectively.

Finally, Pimsleur, Mosberg and Morrison (1962) report on various studies which were carried out to find any relationships which may exist between personality and second-language learning. Pritchard (1952) observed the play behaviour of 32 boys and assigned each a sociability score dependent on their behaviour. He found that his score correlated .72 with the boys' capacity to speak fluently in French. Dunkel (1947) used the Rorschach Test to show that good

second-language learners were those who showed no emotionality, inner conflict or anxiety. Cox (1955) found maladjusted adults to be poor second-language learners. Here again, however, non of these studies specifically tackle the problem of the effect of sex on these variables.

This chapter's organisation into three parts is to emphasise the fact that no study has come to the investigator's attention which deals simultaneously with sex-differences, language aptitude and personality variables. The present thesis is an attempt to find out the ways (if any) in which these three factors are related to each other.

CHAPTER III

DESIGN AND PROCEDURES

DATA COLLECTION

Permission to administer the tests in the school was obtained from the principal. The cooperation of the home-room teachers who were to proctor the test was also secured. Details of the testing procedure recommended by the authors of the tests were reviewed with those concerned prior to the administration of the tests.

The Junior Eysenck Personality Inventory (JEPI) was taken by the students on May 22, 1974. The Modern Language Aptitude Test - Elementary (EMLAT) was given eight days later.

In order to minimise such factors as teacher-oriented responses by the students and fear of using the results of the examination for academic and social standing in the school, the students were told that the examinations were being conducted by an external research organisation as part of a general survey of sixth graders attending public schools.

THE SAMPLE

The grade six level was chosen for this study because all the students attending this particular school would be undifferentiated as to their interests in terms of second-language learning. French is an elective only from the grade seven level, and all students are expected to take French from the grade four to the grade six level on a compulsory basis.

Scheduling the examinations at the Elementary level was also easier because of time-tabling problems at the Junior or Senior High School levels.

There is some evidence to suggest (Eysenck, 1963) that the personality traits to be measured are developed only by the ninth or tenth year of a child's life.

Prior to giving the tests to the sample, the cumulative records for each student were checked for any significant reasons for exclusion from the testing. None were found. This same source also gave data on the I. Q. for each student. Although the I. Q. tests were done during different times for some of the students, and the same test was not used in all cases, the range of I. Q. ran from a low of 71 to a high of 139. The mean was 104. Socio-economic roots for the sample was estimated by noting the occupation(s) of the parent(s) for each student. These ranged from semi-skilled labourers to graduate and post-graduate professionals. The employment of the other parent was also noted. Roughly speaking, the socio-economic class of the sample as a whole lay somewhere between middle and upper-middle classes.

The average age for both boys and girls was 11 years and 9 months. As may be inferred, the range of ages within the sample was quite small.

The number of students who took the JEPI was 145. The day of the EMLAT, however, eight students were absent and so the total sample consisted of only 137 students: 76 boys and 61 girls.

THE TESTS

The standar reference by Buros (1972) was consulted when selecting the tests used in this study. The criteria used in the final selection were the appropriateness of each test for the age of the sample the investigator had in mind and the reputation of the test for measuring what it was designed to measure. Each test is described in

detail in the following sections.

Junior Eysenck Personality Inventory (JEPI)

The JEPI is designed by Eysenck (1963) and is presented in full in Appendix A of this study. The scoring key and the standardisation data are also given.

The test was initially standardised on a group of 6,760 British school children aged from 7 to 16 years. The latter age grouping, however, is largely self-selected and should not be considered valid. Neuroticusm proved to be a consistently measurable trait throughout the age range of the original sample. Extraversion, however, seems to be a personality dimension which does not clearly emerge until the age of nine or ten. A lie scale was standardised on 2,777 children. This scale may be used to determine faking by the students. Although the extraversion and neuroticism scales have been readily accepted in the literature, the lie scale has been subject to different interpretations by researchers, including, significantly, by the author (1963). Eysenck and Eysenck (1963), in a separate study of deliberate faking came to the conclusion that:

> The lie scale items all refer to unusually good behaviour patterns such as never lying, cheating, losing one's temper, et cetera. It is possible that there may be genuine differences here between introverts and extraverts which might account for the observed relations between L and E (p. 354).

The work of Fine (1963), Eysenck (1961) and Eysenck (1954 and 1960) are quoted to support this interpretation which goes beyond a mere faking phenomenon. Semeonoff (1966) uses the study quoted above to extend this interpretation of the lie scale when he considers the "substantial" correlation of this scale to neuroticism. This would encourage the conclusion that stable extraverts are better behaved.

This seems more plausible than the alternative interpretation which would hold that such subjects tell more lies. Whether one can postulate a third dimension to Eysenckian personality theory in terms of a subject's "conventionality" or "non-conventionality" is, of course, both premature and beyond the scope of this study. The investigator is inclined to agree with the authors and the research presented above in considering this extended interpretation of the lie scale as being valid.

Regarding the validity of the measure, Eysenck (1963) mentions a study done on 229 guidance clinic subjects. The prediction of greater neuroticism was validated on this sample. Subjects who were known to be extraverted also validated the measure. A later study by Hall (1969) with educationally sub-normal children replicated these findings.

Cookson (1970) carried out a detailed study on the difficulties in reading and understanding the JEPI. His findings suggest a reading age of 8 to 8.5 as being necessary for adequate understanding of the items. Although duller children tended to understand fewer items than brighter ones, he found no statistically significant evidence to show that difficulties in reading and comprehension were associated with differences between the mean scores of dull and average boys on the three scales of the JEPI.

Modern Language Aptitude Test - Elementary (EMLAT)

The EMLAT is designed by Carroll and Sapon (1967) as a downward extension of their Modern Language Aptitude Test (MLAT). The EMLAT consists of four parts, three of which are suitably modified versions of the MLAT. Appendix B of this study contains the test in full as well as the key and standardisation data.

Part 1 (Hidden Words) measures not only the Ss' knowledge

of English vocabulary, but also a sound-symbol association aptitude. Verbal and auditory skills are presumably involved in the measurement.

Part 2. (Matching Words) is designed to measure sensitivity to grammatical structure (syntax). No grammatical terms are used, however, and so a formal knowledge of the grammar of English is not necessary for a child to complete this subtest.

Part 3. (Finding Rhymes) evaluates another auditory skill, namely, sound discrimination. This is the only part of EMLAT which does not have an equivalent form in the MLAT. It should be noted, however, that as the EMLAT is a paper and pencil test, no actual sounds are involved in this evaluation. No research seems to have been done to evaluate the validity of such a method (Hakstian, 1972).

Part 4. (Number Learning) measures the ability of a student to memorise sounds over a short period of time. Carroll and Sapon (1959) determined from the parallel section of the MLAT that

> ...the part also has a fairly large specific variance, which one might guess to be a special auditory alertness factor which would play a role in auditory comprehension of a foreign language.

ORGANISATION OF DATA

The EMLAT and JEPI were scored by hand. The figures obtained in this manner were recorded for each student. An identification number was assigned to each S. In order to optimise the usefulness of the results for statistical analysis, the extraversion, neuroticism, and lie-scale scores were categorised into three groups for high, medium, and low scores on each measure. This was done in such a way as to keep the number within each category as equal as possible for each of the three scales. This information was then transferred to a card format

compatible with the available computer hardware of the University of Alberta. Appendix C contains a listing of the raw scores and the other relevant information as recorded on the cards.

STATISTICAL TREATMENT OF DATA

Existing computer programmes from the Division of Educational Research Services at the University of Alberta were used in the analysis of the data. Three programmes were used to evaluate the different aspects of the hypotheses.

1. DEST02: The title of this programme is "Pearson product moment correlations" (Hunka, 1973). Means, variances, standard deviations and correlation coefficients together with their probabilities are output.

2. ANCV15: The title of this programme is "One-way analysis of variance and co-variance" (Bay and Abell, 1974). Unequal Ns are permitted and Scheffe multiple comparisons may be output.

3. ANCV25: The title of this programme is "General purpose two-way analysis of covariance and variance" (Bay and Abell, 1974). Unequal Ns are permitted and Scheffe multiple comparisons may be output.

In order to provide a clear picture of the results, tables and graphs were constructed based on the computer output and will be presented in the next chapter. Scheffe's multiple comparison of means are reported in the figures.

CHAPTER IV

RESULTS AND DISCUSSION

As would be expected, the results obtained from the sample used in this study differed in certain respects from the norms of the JEPI and the EMLAT. These differences are presented in Appendix D.

A probability value of .15 will be used to determine the acceptance or rejection of the null hypotheses which were presented earlier in this thesis. This value was chosen because of the complexity of the measures involved (Bain, 1973).

CORRELATIONS

Sex and personality variables

The results for boys are summarised in Table I. The insignificant negative correlation between extraversion (E) and neuroticism (N), and the similar result for E and the lie-scale scores (L) agrees with the standardised data for the JEPI. The highly significant negative correlation for N and L is also in agreement with available research data (Waters, 1968 and Eysenck, Syed and Eysenck, 1965). It is surmised, therefore, that N and E are for all purposes orthogonal and that Ss with good behavioural characteristics tend to be more stable in their personality.

Table II shows that girls do not follow the same patterns as found in the boys' extraversion. Here, one can see that the relationship between E and N is not orthogonal. Furthermore, unlike boys, girls have an inverse relationship for their good behavioural characteristics and E. They are similar to the boys, however, in terms of L and N. The relationship of L and E could perhaps be attributed to the social mores operating on the Ss: "well behaved" girls are supposed to be

introverted (passive, reserved and quiet) whereas boys have no such constrictions, as it is "natural" for "well-behaved" boys to be either extraverted or introverted.

TABLE I

CORRELATIONS OF PERSONALITY VARIABLES FOR BOYS

Personality Variable	Personality Variable: Extraversion	Personality Variable: Neuroticism
	Correlations	
Neuroticism	-.12	
Lying	-.09	-.36
	t-values	
Neuroticism	-1.02	
Lying	-0.77	-3.31
	Probabilities of *t*	
Neuroticism	.31	
Lying	.45	.01

df = 74

$p < .15$

TABLE II

CORRELATIONS OF PERSONALITY VARIABLES FOR GIRLS

Personality Variable	Personality Variable: Extraversion	Personality Variable: Neuroticism
	Correlations	
Neuroticism	-.23	
Lying	-.20	-.21
	t-values	
Neuroticism	-1.85	
Lying	-1.56	-1.61
	Probabilities of *t*	
Neuroticism	.07	
Lying	.12	.11

df = 59

$p < .15$

Sex and second-language aptitudes

Table III and Table IV show that there is no essential difference in the correlations obtained for either sex on the various EMLAT scores. With only two exceptions for the twenty correlations given, there is a strong trend that suggests that the subtests are interrelated. The two exceptions appear in the EMLAT part 2 and part 4 correlation for boys (Table III). As far as this particular sample of boys is concerned, knowledge of syntax is insignificantly correlated with memory and auditory alertness.

Although this does not appear to be the case for girls (Table IV), this sample nonetheless showed that vocabulary and sound-symbol association are orthogonal - as the correlation coefficient for their EMLAT part 1 and part 4 shows.

As these low correlations have not been encountered elsewhere in the literature, and as these particular coefficients are in marked contrast to the others, it is suggested that they reflect a statistical aberration which cannot be attributed to sex-differences but rather to an idiosyncrasy of the sample used. In any case, these correlations do not diminish the evaluation of the hypotheses to be investigated, they do, however, suggest that the authors' contention (Carroll and Sapon, 1969) that the subtests are independent is not valid in this particular case.

TABLE III

CORRELATIONS OF SECOND-LANGUAGE APTITUDE VARIABLES FOR BOYS

Aptitude Variable	Aptitude Variable			
	EMLAT Part 1. Hidden words	EMLAT Part 2. Matching Words	EMLAT Part 3. Finding Rhymes	EMLAT Part 4. Number Learning
		Correlations		
EMLAT Part 2.	.41			
EMLAT Part 3.	.58	.32		
EMLAT Part 4.	.39	.09	.23	
EMLAT Total	.80	.57	.65	.75
		t-values		
EMLAT Part 2.	3.85			
EMLAT Part 3.	6.16	2.91		
EMLAT Part 4.	3.67	0.75	2.01	
EMLAT Total	11.42	6.00	7.39	9.76
		Probabilities of t		
EMLAT Part 2.	.01			
EMLAT Part 3.	.01	.01		
EMLAT Part 4.	.01	.46	.05	
EMLAT Total	.01	.01	.01	.01

df = 74
$p < .15$

TABLE IV

CORRELATIONS OF SECOND-LANGUAGE APTITUDE VARIABLES FOR GIRLS

Aptitude Variable	Aptitude Variable: EMLAT Part 1. Hidden Words	EMLAT Part 2. Matching Words	EMLAT Part 3. Finding Rhymes	EMLAT Part 4. Number Learning
		Correlations		
EMLAT Part 2.	.43			
EMLAT Part 3.	.49	.24		
EMLAT Part 4.	.17	.40	.30	
EMLAT Total	.64	.73	.59	.80
		t-values		
EMLAT Part 2.	3.69			
EMLAT Part 3.	4.32	1.93		
EMLAT Part 4.	1.35	3.30	2.41	
EMLAT Total	6.38	8.30	5.54	10.30
		Probabilities of *t*		
EMLAT Part 2.	.01			
EMLAT Part 3.	.01	.06		
EMLAT Part 4.	.18	.01	.02	
EMLAT Total	.01	.01	.01	.01

df = 59
$p < .15$

Personality and second-language aptitudes for each sex

Table V shows that boys do have a significant negative correlation between N and EMLAT part 1, part 4, and the total EMLAT score. Stable Ss tend to have higher scores on the subtests and the total. This may be interpreted to mean that restless boys are negatively affected by a testing situation and consequently tend to make more mistakes than their less nervous colleagues. Another interpretation is that neuroticism inversely affects their ability to piece together the clues of the Hidden Words test. Their neuroticism also affects their ability to focus on a task requiring concentration such as the number learning task. Cookson (1970) has also reported a trend for neuroticism scores to be inversely related to reading ability. The correlations obtained in this study may therefore be reflecting this difference in reading levels. It must be stated, however, that Cookson did not find this relationship to be significant for his sample.

The results obtained for the girls show no significant correlations on any of the scores. Anticipating the results obtained in the more detailed analysis to be reported later in this thesis, it can be said that this lack of significant correlation is not because none exists but because the correlation between them is not linear. It must be emphasised that the relationships calculated here assume that the variables are linear - an assumption which in this study is not always applicable.

TABLE V

CORRELATIONS OF PERSONALITY AND SECOND-LANGUAGE APTITUDE FOR BOYS

Personality Variables	Second-language aptitude variables: EMLAT Part 1. Hidden Words	EMLAT Part 2. Matching Words	EMLAT Part 3. Finding Rhymes	EMLAT Part 4. Number Learning	EMLAT Total
			Correlations		
Extraversion	-.02	.06	.05	-.13	-.05
Neuroticism	-.21	-.13	-.14	-.21	-.25
Lying	-.01	-.17	-.04	.04	-.05
			t-values		
Extraversion	-0.17	0.55	0.46	-1.15	-0.39
Neuroticism	-1.81	-1.15	-1.19	-1.80	-2.24
Lying	-0.12	-1.48	-0.36	0.35	-0.40
			Probabilities of t		
Extraversion	.87	.59	.65	.26	.70
Neuroticism	.07	.26	.24	.08	.03
Lying	.91	.14	.72	.73	.69

df = 74

$p < .15$

TABLE VI

CORRELATIONS OF PERSONALITY AND SECOND-LANGUAGE APTITUDE FOR GIRLS

Personality Variables	Second - language aptitude variables				
	EMLAT Part 1. Hidden Words	EMLAT Part 2. Matching Words	EMLAT Part 3. Finding Rhymes	EMLAT Part 4. Number Learning	EMLAT Total
			Correlations		
Extraversion	.09	.04	.06	.09	.10
Neuroticism	-.11	-.06	-.06	.03	-.05
Lying	-.01	-.13	.08	-.11	-.09
			t-values		
Extraversion	0.70	0.27	0.46	0.71	0.79
Neuroticism	-0.88	-0.47	-0.42	0.22	-0.38
Lying	-0.09	-0.99	0.60	-0.83	-0.71
			Probabilities of t		
Extraversion	.48	.79	.65	.48	.43
Neuroticism	.38	.64	.68	.83	.71
Lying	.93	.32	.55	.41	.48

df = 59

$p < .15$

ONE-WAY ANALYSIS OF VARIANCE

Sex and personality variables

The first hypothesis of this thesis was that:

"There is no significant difference between boys and girls for extraversion."

Table VII shows the results of the analysis done to verify the hypothesis. As can be seen this hypothesis cannot be rejected at the .15 level of confidence. The mean scores obtained for boys and girls on the E scale were 17.70 and 17.85 respectively. The standard deviation for boys was 2.99, and for girls 3.41.

The second hypothesis of this thesis was that:

"There is no significant difference between boys and girls for neuroticism."

Once again, the data provided in Table VII does not justify rejection of the hypothesis at the .15 level of confidence. The mean scores obtained for boys and girls on the N scale were 13.24 and 13.54 respectively. The standard deviation for boys was 5.35, and for girls 4.92.

The third hypothesis of this thesis was that:

"There is no significant difference between boys and girls for the lie scale."

This hypothesis may be rejected at the .15 level of confidence. Table VII actually shows that the significance level is as low as .01. The mean scores on this measure are 2.18 for boys and 3.10 for girls. This proves that girls are actually better behaved than boys - a conclusion which is validated by the personal acquaintance of the investigator with this sample over a period of three academic years. In the review of the literature, the investigator failed to find any study in which the author could claim such acquaintanceship with the Ss.

TABLE VII

ONE-WAY ANALYSIS OF VARIANCE : SEX AND PERSONALITY VARIABLES

Source	SS	df	MS	F	p
Sex	0.81	1	0.81	0.08	.78
Extraversion	1387.74	135	10.28		
Sex	3.13	1	3.13	0.12	.73
Neuroticism	3654.90	135	27.07		
Sex	28.28	1	28.28	6.51	.01
Lying	586.83	135	4.35		

Homogeneity of variance:

Extraversion	$\chi^2 = 1.15$	$p = .28$
Neuroticism	$\chi^2 = 0.45$	$p = .50$
Lying	$\chi^2 = 2.87$	$p = .09$

$p < .15$

Sex and second-language aptitude variables

The results are summarised in Table VIII. Hypothesis four was that:

> "There is no significant difference between boys and girls for second-language aptitudes."

In terms of total second-language aptitude, the obtained "p" value of .48 does not allow rejection of the null hypothesis at the .15 level of confidence. It will be seen, however, that the various facets of second-language aptitude as represented by the four subtests of the EMLAT do not give such a clear-cut answer to the hypothesis. Although no sex differences are apparent for the first and fourth subtests, parts 2 and 3 do show significant differences for boys and girls. For part 2 (Matching Words), the mean score of girls was 17.90 whereas for boys it was only 16.13. It can be argued, therefore, that girls have a better perception of the syntax of a language than boys do. Part 3 (Finding Rhymes) also shows a difference in favour of the girls. The mean scores on this subtest were 43.02 and 41.89 for girls and boys respectively. It would appear that girls have a better sound discrimination ability than boys do.

These results show that the observed superiority of girls over boys in an actual classroom situation is not dependent on either sound-symbol association abilities or memory and auditory alertness. A teacher's evaluation of a student's performance in a second language depends rather on the child's sensitivity to syntax and sound discrimination ability.

It must be noted here that the investigator does not imply that these two traits are the only ones which come into play in learning a second language. The review of the relevant literature should convince

the reader that learning a second language is not simply having a "good ear" or a "good feel" for the language. What is suggested is that these discussions and conclusions must be taken within the limited context of this study.

TABLE VIII

ONE-WAY ANALYSIS OF VARIANCE: SEX AND SECOND-LANGUAGE APTITUDE VARIABLES

Source	SS	df	MS	F	p
Sex	13.83	1	13.83	0.62	.43
EMLAT-Part 1. Hidden Words	2994.19	135	22.18		
Sex	106.02	1	106.02	4.31	.04
EMLAT-Part 2. Matching Words	3324.15	135	24.62		
Sex	42.57	1	42.57	3.79	.05
EMLAT-Part 3. Finding Rhymes	1518.31	135	11.25		
Sex	94.35	1	94.35	1.34	.25
EMLAT-Part 4. Number Learning	9497.77	135	70.35		
Sex	117.24	1	117.24	0.51	.48
EMLAT-Total	31228.00	135	231.32		

Homogeneity of variance:

EMLAT - Part 1.	$\chi^2 = 0.08$	$p = .77$
EMLAT - Part 2.	$\chi^2 = 0.11$	$p = .74$
EMLAT - Part 3.	$\chi^2 = 4.26$	$p = .04$
EMLAT - Part 4.	$\chi^2 = 0.03$	$p = .85$
EMLAT - Total	$\chi^2 < 0.01$	$p = .96$

$p < .15$

TWO-WAY ANALYSIS OF VARIANCE OF SECOND-LANGUAGE APTITUDE VARIABLES

Sex and extraversion

The results are summarised on the following pages in Table IX and presented graphically in Figures I to V.

The fifth hypothesis was that:

> "There is no significant difference between boys and girls for extraversion and second-language aptitudes."

The sample was categorised for high extraversion (HE), medium extraversion (ME) and low extraversion (LE), using the scores of 20 and 16 as cut-off points to separate the categories for this sample. The lines on the graphs are not continuous to emphasise that the categories are discrete.

The calculated "p" values for the AB effects do not justify the rejection of the hypothesis. As can be seen from the table, these "p" values run from a low of .31 to a high of .86, well above the limit of .15.

The Scheffe multiple correlations reported in Figures I to V, however, show that significant differences do exist when the effect of sex is removed. Figures I and III show that for both part 1 and part 3 of the EMLAT, HE do significantly better on these subtests than their ME counterparts. Although a curvilinear trend is probable as shown in the figures, none of the ME and LE correlations were significant. These findings do not confirm the Eysenckian postulate that lower extraversion is beneficial to academic success (Savage, 1962).

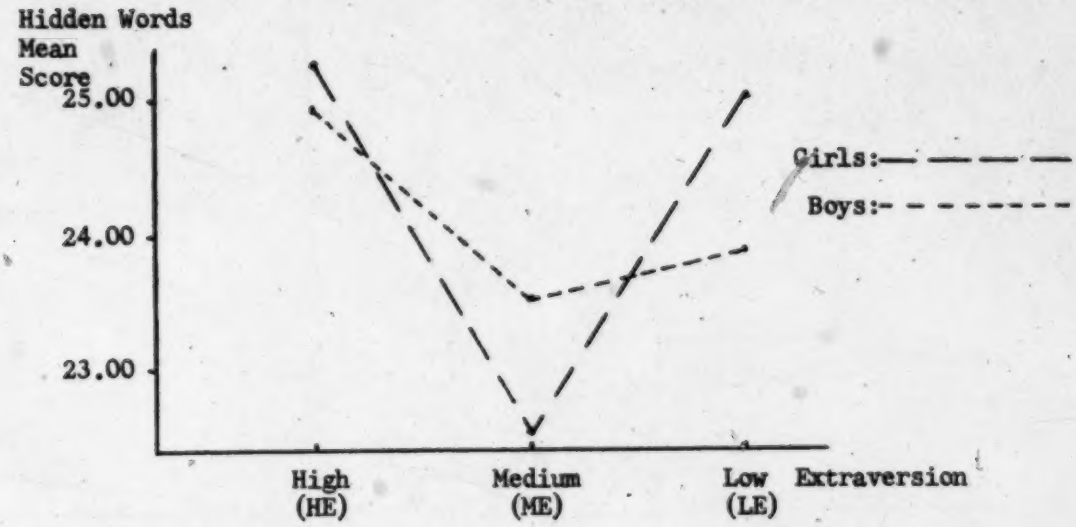
TABLE IX

TWO-WAY ANALYSIS OF VARIANCE: SECOND-LANGUAGE APTITUDE VARIABLES FOR SEX AND EXTRAVERSION

Source	SS	df	MS	F	p
EMLAT-Part 1. (Hidden Words)					
A: Sex	1.02	1	1.02	0.05	.83
B: Extraversion	92.22	2	46.11	2.09	.13
AB	24.13	2	12.06	0.55	.58
Errors	2896.19	131	22.11		
EMLAT-Part 2. (Matching Words)					
A: Sex	95.85	1	95.85	3.79	.05
B: Extraversion	3.33	2	1.66	0.07	.94
AB	8.19	2	4.09	0.16	.85
Errors	3313.01	131	25.29		
EMLAT-Part 3. (Finding Rhymes)					
A: Sex	18.92	1	18.92	1.70	.19
B: Extraversion	51.84	2	25.92	2.33	.10
AB	26.29	2	13.15	1.18	.31
Errors	1455.63	131	11.11		
EMLAT-Part 4. (Number Learning)					
A: Sex	159.47	1	159.47	2.25	.14
B: Extraversion	189.71	2	94.85	1.34	.27
AB	21.13	2	10.57	0.15	.86
Errors	9303.46	131	71.02		
EMLAT - Total					
A: Sex	6.35	1	6.35	0.03	.87
B: Extraversion	911.95	2	455.98	1.98	.14
AB	275.70	2	137.85	0.60	.55
Errors	30233.00	131	230.79		

$p < .15$

FIGURE I: GRAPH- EXTRAVERSION VERSUS EMLAT PART 1. (Hidden Words)



EMLAT Part 1. (Hidden Words)

Extraversion		Boys	N	Girls	N
High	(HE)	24.95	19	25.30	27
Medium	(ME)	23.53	34	22.54	13
Low	(LE)	23.91	23	25.10	21

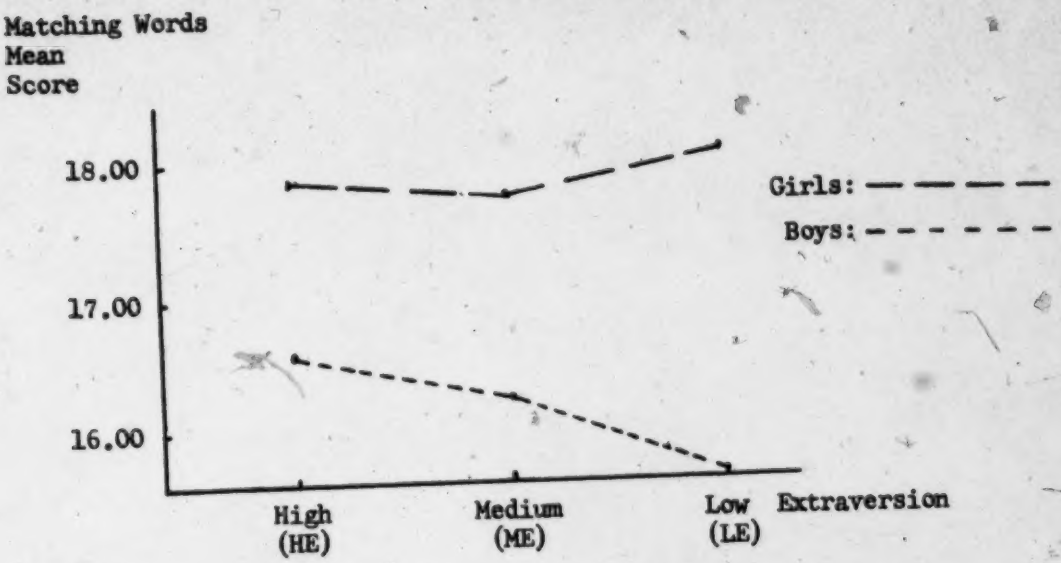
Homogeneity of variances:

$\chi^2 = 11.72$ df = 5 p = .04

Probability matrix for Scheffe multiple comparison of means:

	HE	ME
ME	.14	
LE	.83	.37

FIGURE II: GRAPH- EXTRAVERSION VERSUS EMLAT PART 2. (Matching Words)



EMLAT Part 2. (Matching Words)

Extraversion		Boys	N	Girls	N
High	(HE)	16.85	19	17.85	27
Medium	(ME)	16.24	34	17.77	13
Low	(LE)	15.61	23	18.05	21

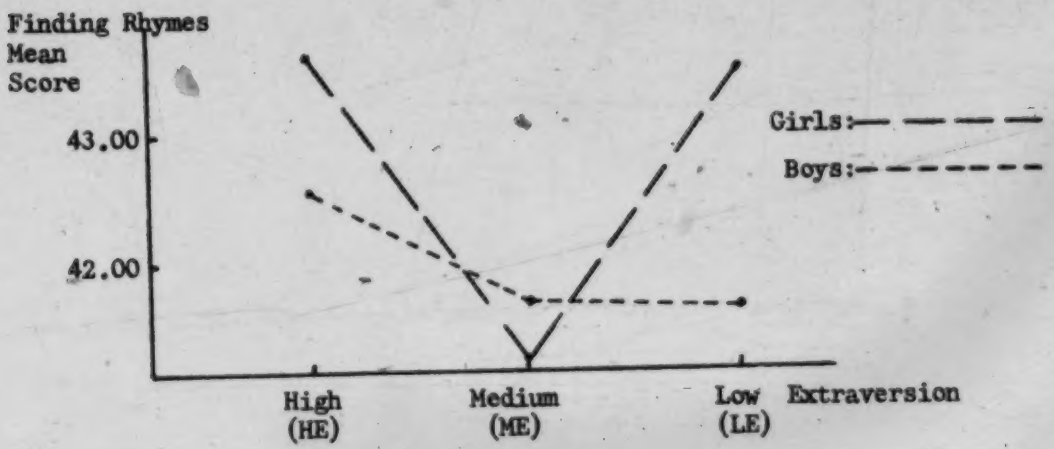
Homogeneity of variances:

$\chi^2 = 5.07$ df = 5 p = .41

Probability matrix for Scheffe multiple comparison of means:

	HE	ME
ME	.98	
LE	.94	.99

FIGURE III: GRAPH- EXTRAVERSION VERSUS EMLAT PART 3. (Finding Rhymes)



EMLAT Part 3.(Finding Rhymes)

Extraversion		Boys	N	Girls	N
High	(HE)	42.53	19	43.56	27
Medium	(ME)	41.71	34	41.23	13
Low	(LE)	41.65	23	43.43	21

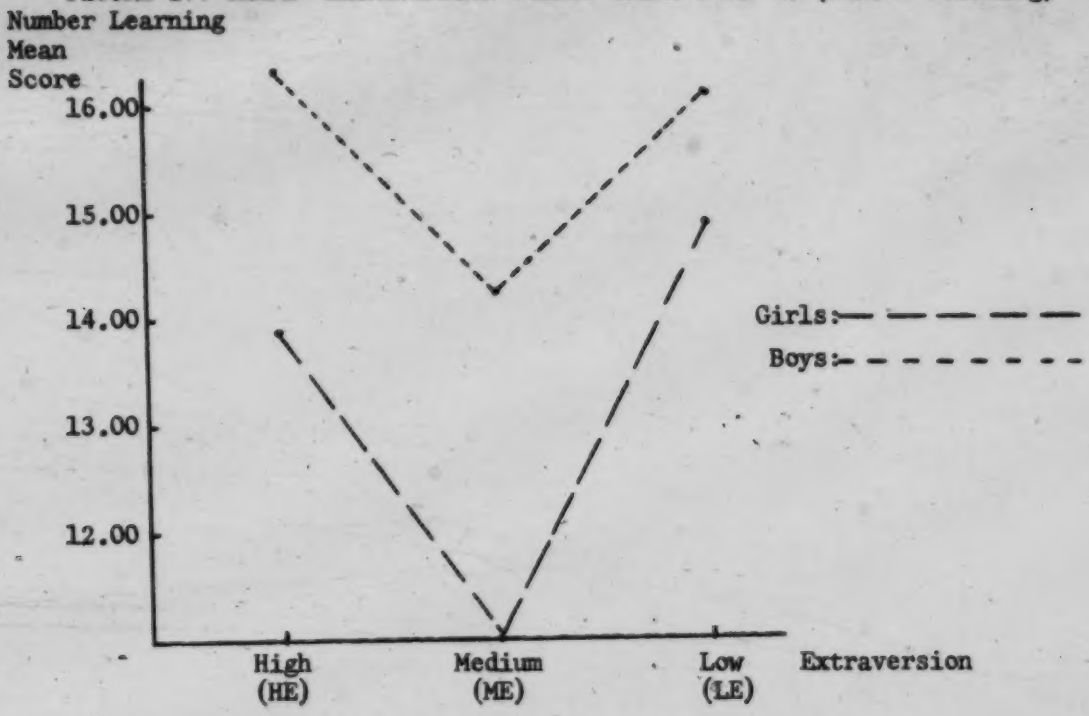
Homogeneity of variances:

$\chi^2 = 49.93$ df = 5 $p < .01$

Probability matrix for Scheffe multiple comparison of means:

	HE	ME
ME	.12	
LE	.78	.35

FIGURE IV: GRAPH- EXTRAVERSION VERSUS EMLAT PART 4. (Number Learning)



. EMLAT Part 4. (Number Learning)

Extraversion		Boys	N	Girls	N
High	(HE)	16.26	19	13.89	27
Medium	(ME)	14.21	34	11.00	13
Low	(LE)	16.04	23	14.86	21

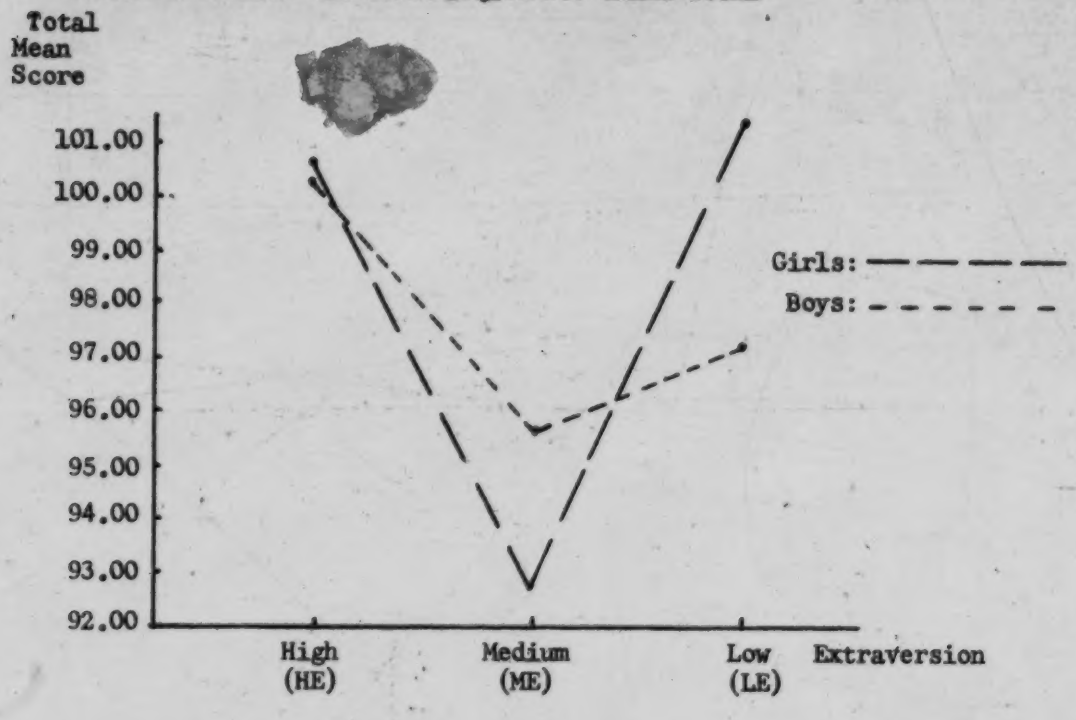
Homogeneity of variances:

$\chi^2 = 1.63$ df = 5 p = .90

Probability matrix for Scheffe multiple comparison of means:

	HE	ME
ME	.42	
LE	.98	.32

FIGURE V: GRAPH- EXTRAVERSION VERSUS EMLAT TOTAL



EMLAT Total

Extraversion		Boys	N	Girls	N
High	(HE)	100.32	19	100.59	27
Medium	(ME)	95.68	34	92.54	13
Low	(LE)	97.22	23	101.43	21

Homogeneity of variances:

$\chi^2 = 13.26$ df = 5 p = .02

Probability matrix for Scheffe multiple comparison of means:

	HE	ME
ME	.17	
LE	.94	.31

Sex and neuroticism

The results are summarised in Table X and presented graphically in Figures VI to X which follow this page.

The sixth hypothesis was that:

> "There is no significant difference between boys and girls for neuroticism and second-language aptitudes."

The sample was categorised for high neuroticism (HN), medium neuroticism (MN) and low neuroticism (LN) using scores of 16 and 11 as cut-off points to separate the categories for this sample. The lines on the graphs are not continuous to emphasise that the categories are discrete.

The calculated "p" values for the AB effects do not justify the rejection of the hypothesis. The range of these "p" values can be seen from the table to run from a low of .43 to a high of .99.

The Scheffe multiple correlations do not yield any significant results on any of the combinations. This finding is in contrast to a study by Entwistle and Cunningham (1968) where a linear relationship was more convincingly demonstrated. The trend of the sample used in this thesis, however, is in general agreement with their results. The correlations shown in Table V demonstrate this fact. What makes the overall picture less clear, however, is the result obtained for the girls in that same analysis (Table VI).

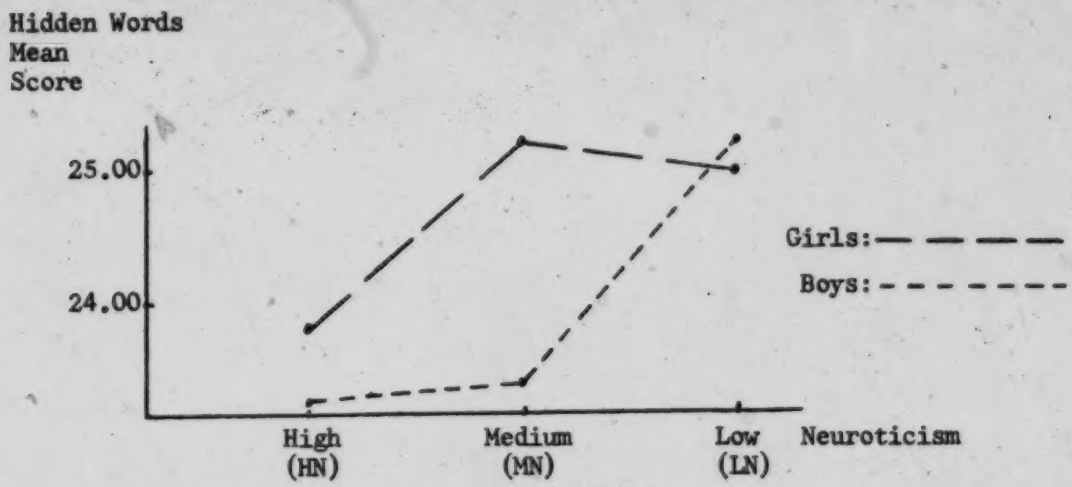
TABLE X

TWO-WAY ANALYSIS OF VARIANCE: SECOND-LANGUAGE APTITUDE VARIABLES FOR SEX AND NEUROTICISM

Source	SS	df	MS	F	p
EMLAT-Part 1. (Hidden Words)					
A: Sex	16.27	1	16.27	0.73	.39
B: Neuroticism	55.48	2	27.74	1.25	.29
AB	23.11	2	11.56	0.52	.60
Errors	2910.75	131	22.22		
EMLAT-Part 2. (Matching Words)					
A: Sex	107.28	1	107.28	4.32	.04
B: Neuroticism	24.33	2	12.16	0.49	.61
AB	42.30	2	21.15	0.85	.43
Errors	3255.22	131	24.85		
EMLAT-Part 3. (Finding Rhymes)					
A: Sex	41.87	1	41.87	3.71	.06
B: Neuroticism	36.71	2	18.35	1.62	.20
AB	0.28	2	0.14	0.01	.99
Errors	1479.94	131	11.30		
EMLAT-Part 4. (Number Learning)					
A: Sex	93.99	1	93.99	1.34	.25
B: Neuroticism	184.93	2	92.47	1.32	.27
AB	118.21	2	59.10	0.84	.43
Errors	9170.81	131	70.01		
EMLAT - Total					
A: Sex	124.72	1	124.72	0.55	.46
B: Neuroticism	881.26	2	440.63	1.93	.15
AB	296.77	2	148.39	0.65	.52
Errors	29954.00	131	228.66		

$p < .15$

FIGURE VI: GRAPH- NEUROTICISM VERSUS EMLAT PART 1. (Hidden Words)



EMLAT Part 1. (Hidden Words)

Neuroticism		Boys	N	Girls	N
High	(HN)	23.29	24	23.82	22
Medium	(MN)	23.42	26	25.21	19
Low	(LN)	25.23	26	25.00	20

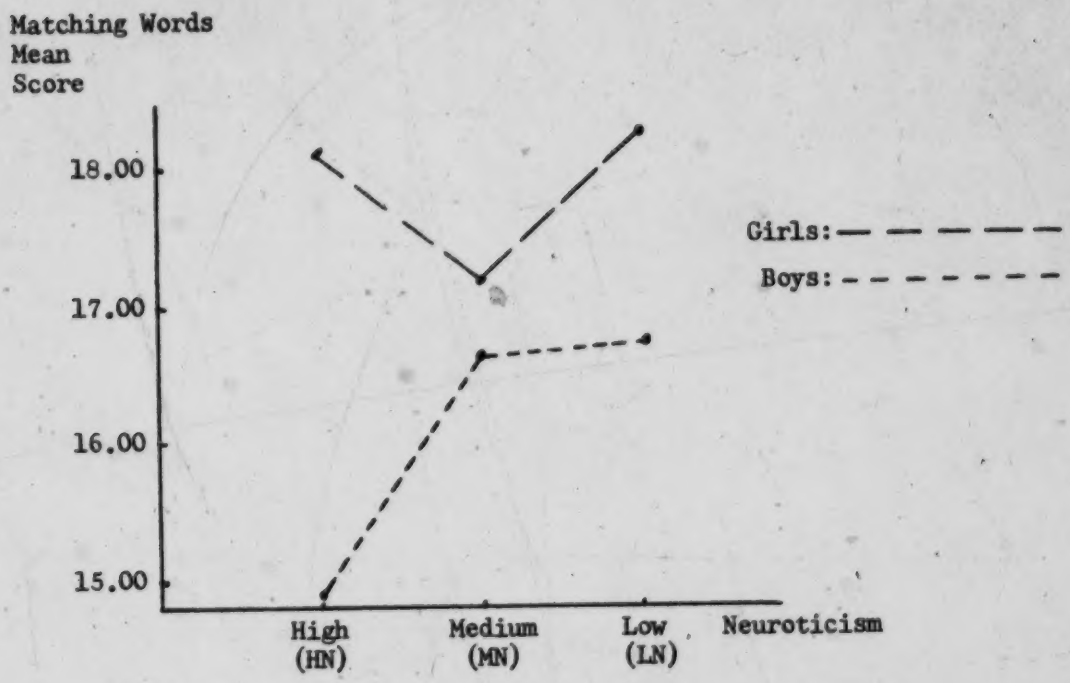
Homogeneity of variances:

$\chi^2 = 3.53$ df = 5 p = .62

Probability matrix for Scheffe multiple comparison of means:

	HN	MN
MN	.75	
LN	.29	.73

FIGURE VII: GRAPH- NEUROTICISM VERSUS EMLAT PART 2. (Matching Words)



EMLAT Part 2. (Matching Words)

Neuroticism		Boys	N	Girls	N
High	(HN)	14.88	24	18.14	22
Medium	(MN)	16.65	26	17.21	19
Low	(LN)	16.77	26	18.30	20

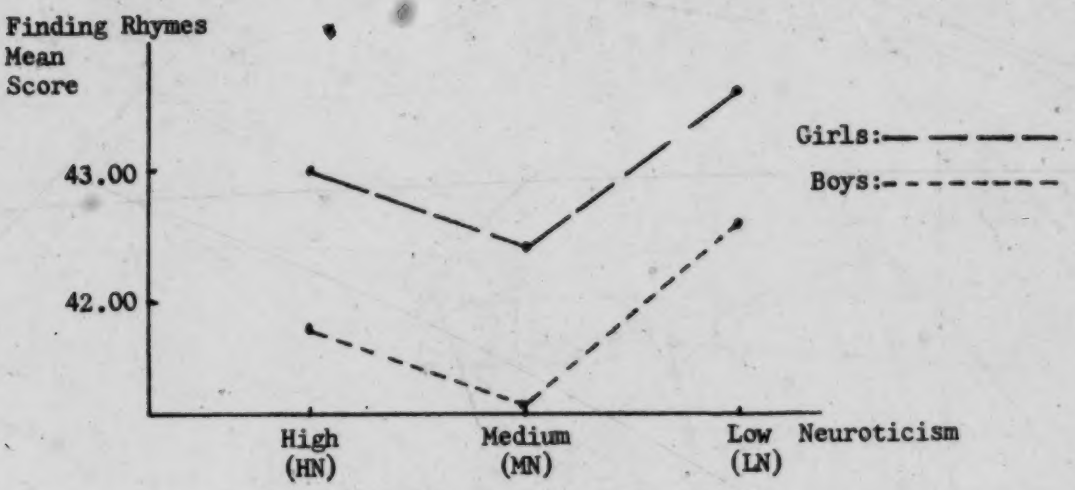
Homogeneity of variances:

$\chi^2 = 1.08$ df = 5 p = .96

Probability matrix for Scheffe multiple comparison of means:

	HN	MN
MN	.92	
LN	.62	.85

FIGURE VIII: GRAPH- NEUROTICISM VERSUS EMLAT PART 3. (Finding Rhymes)



EMLAT Part 3. (Finding Rhymes)

Neuroticism		Boys	N	Girls	N
High	(HN)	41.83	24	43.00	22
Medium	(MN)	41.23	26	42.42	19
Low	(LN)	42.62	26	43.60	20

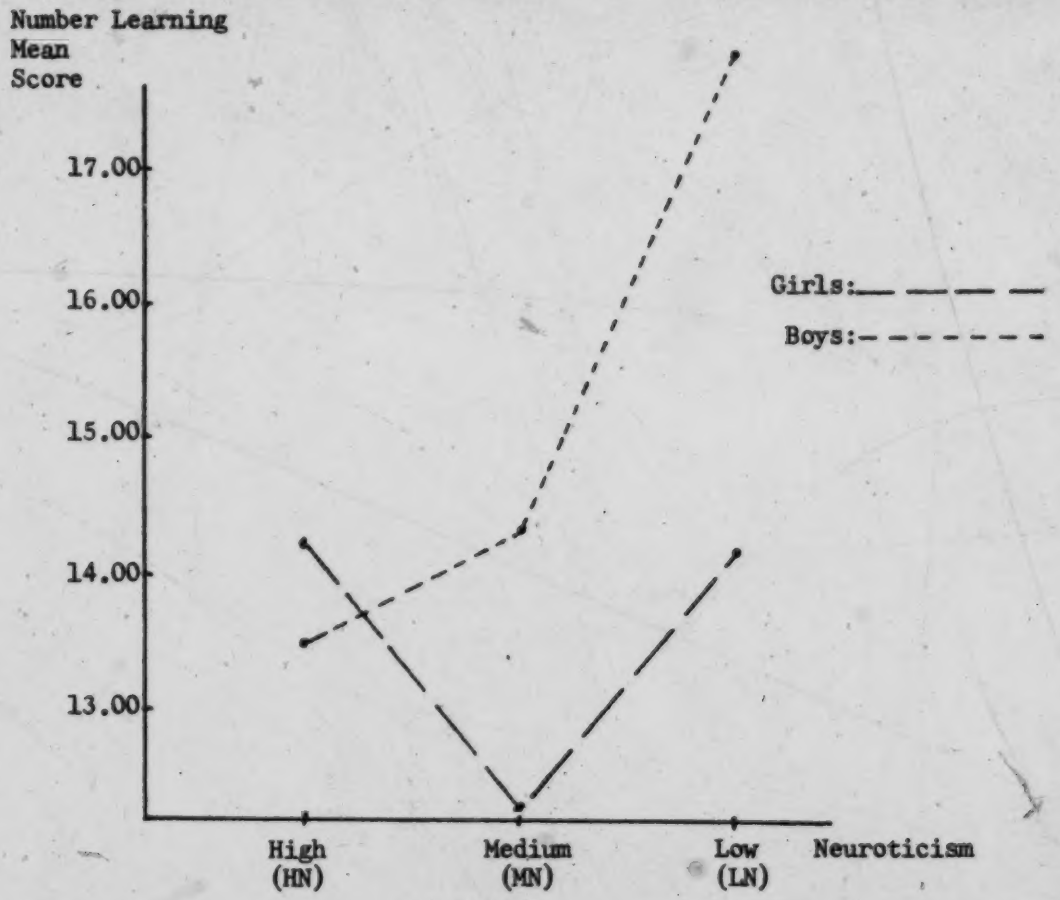
Homogeneity of variances:

$\chi^2 = 26.23$ df = 5 $p < .01$

Probability matrix for Scheffe multiple comparison of means:

	HN	MN
MN	.71	
LN	.62	.20

FIGURE IX: GRAPH- NEUROTICISM VERSUS EMLAT PART 4. (Number Learning)



EMLAT Part 4. (Number Learning)

Neuroticism		Boys	N	Girls	N
High	(HN)	13.50	24	14.27	22
Medium	(MN)	14.31	26	12.26	19
Low	(LN)	17.89	26	14.15	20

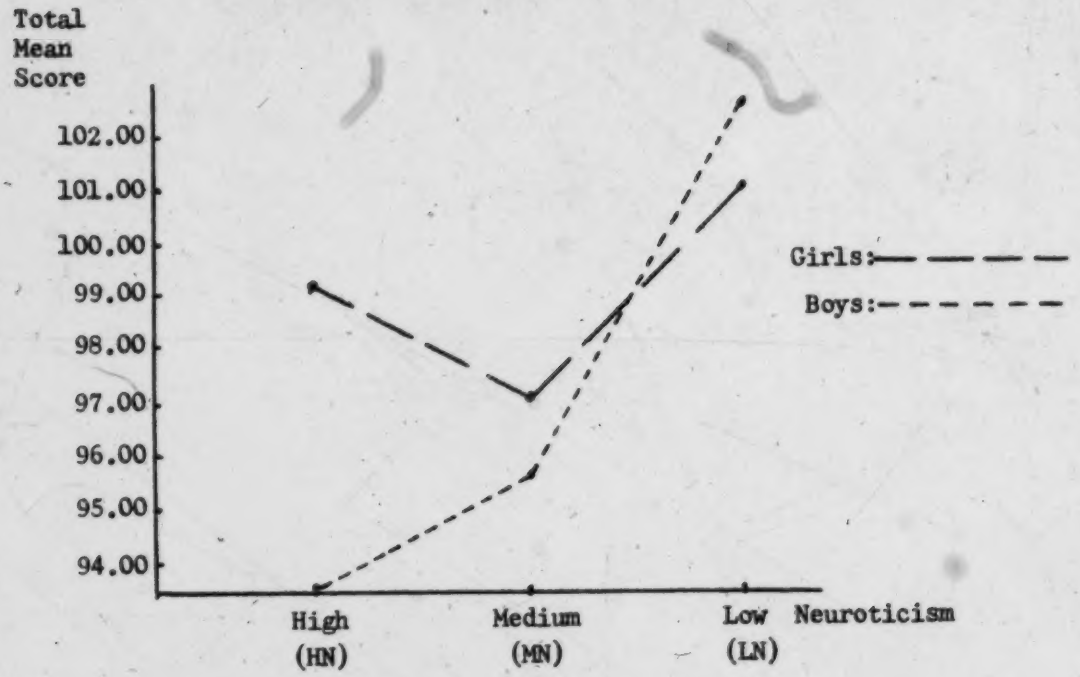
Homogeneity of variances:

$\chi^2 = 2.18$ df = 5 p = .82

Probability matrix for Scheffe multiple comparison of means:

	HN	MN
MN	.94	
LN	.48	.31

FIGURE X: GRAPH- NEUROTICISM VERSUS EMLAT TOTAL



EMLAT Total

Neuroticism		Boys	N	Girls	N
High	(HN)	93.50	24	99.23	22
Medium	(MN)	95.62	26	97.12	19
Low	(LN)	102.50	26	101.05	20

Homogeneity of variances:

$\chi^2 = 4.78$ df = 5 p = .44

Probability matrix for Scheffe multiple comparison of means:

	HN	MN
MN	.99	
LN	.24	.24

Sex and lying

The results are summarised in Table XI and presented graphically in Figures XI to XV which follow.

The seventh hypothesis was that:

"There is no significant difference between boys and girls for lying and second-language aptitudes."

The sample was categorised for high lying (HL), medium lying (ML) and low lying (LL) subjects, using scores of 3 and 1 as cut-off points to separate the categories for this sample. The lines on the graphs are not continuous to emphasise the fact that the categories are discrete.

The calculated "p" value for the AB effect for the EMLAT part 2 justifies the rejection of the hypothesis at the .11 level of confidence. The hypothesis is justified, however, for the other subtests and for the total as the "p" values calculated range from .29 to .97.

As would be expected, it is only the Scheffe multiple comparisons for the EMLAT part 2 which yield significant values (Figure XII). The differences observed in the scores for HL boys and ML boys is significantly different from the comparable samples of girls.

This finding, however, is marred by the low Ns within the cells: varying, as they do, from 18 to 28. It could be argued that a statistic on such a small sample should be replicated with a larger N than reported here. The investigator readily concedes this point.

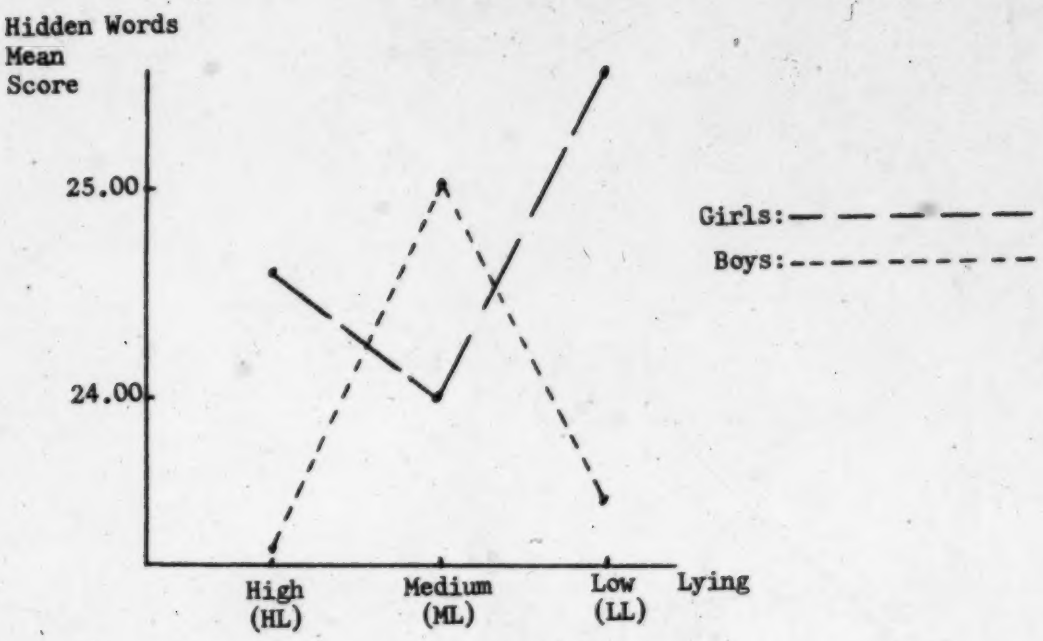
TABLE XI

TWO-WAY ANALYSIS OF VARIANCE: SECOND-LANGUAGE APTITUDE VARIABLES FOR SEX AND LYING

Source	SS	df	MS	F	p
	EMLAT-Part 1. (Hidden Words)				
A: Sex	19.36	1	19.36	0.87	.35
B: Lying	9.93	2	4.96	0.22	.80
AB	55.69	2	27.85	1.25	.29
Errors	2928.69	131	22.36		
	EMLAT-Part 2. (Matching Words)				
A: Sex	155.21	1	155.21	6.56	.01
B: Lying	132.82	2	66.41	2.81	.06
AB	106.45	2	53.23	2.25	.11
Errors	3098.26	131	23.65		
	EMLAT-Part 3. (Finding Rhymes)				
A: Sex	33.19	1	33.19	2.88	.09
B: Lying	6.93	2	3.47	0.30	.74
AB	0.51	2	0.26	0.02	.97
Errors	1510.88	131	11.53		
	EMLAT-Part 4. (Number Learning)				
A: Sex	95.25	1	95.25	1.32	.25
B: Lying	6.65	2	3.33	0.05	.95
AB	56.85	2	28.42	0.39	.67
Errors	9437.43	131	72.04		
	EMLAT - Total				
A: Sex	165.39	1	165.39	0.70	.40
B: Lying	122.07	2	61.03	0.26	.77
AB	102.73	2	51.37	0.22	.81
Errors	31005.00	131	236.68		

$p < .15$

FIGURE XI: GRAPH- LYING VERSUS EMLAT PART 1. (Hidden Words)



EMLAT Part 1. (Hidden Words)

Lying		Boys	N	Girls	N
High	(HL)	23.28	18	24.61	28
Medium	(ML)	25.04	27	24.00	19
Low	(LL)	23.52	31	25.58	14

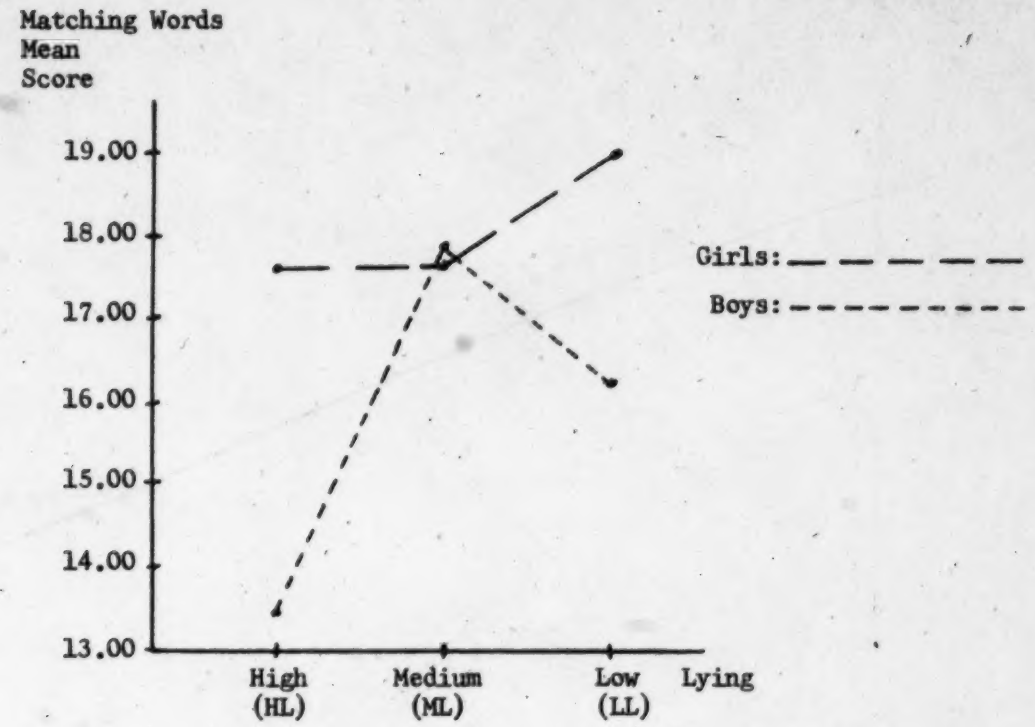
Homogeneity of variances:

$\chi^2 = 1.88$ df = 5 p = .87

Probability matrix for Scheffe multiple comparison of means:

	HL	ML
ML	.85	
LL	.85	.99

FIGURE XII: GRAPH- LYING VERSUS EMLAT PART 2. (Matching Words)



EMLAT Part 2. (Matching Words)

Lying		Boys	N	Girls	N
High	(HL)	13.44	18	17.57	28
Medium	(ML)	17.82	27	17.63	19
Low	(LL)	16.23	31	18.93	14

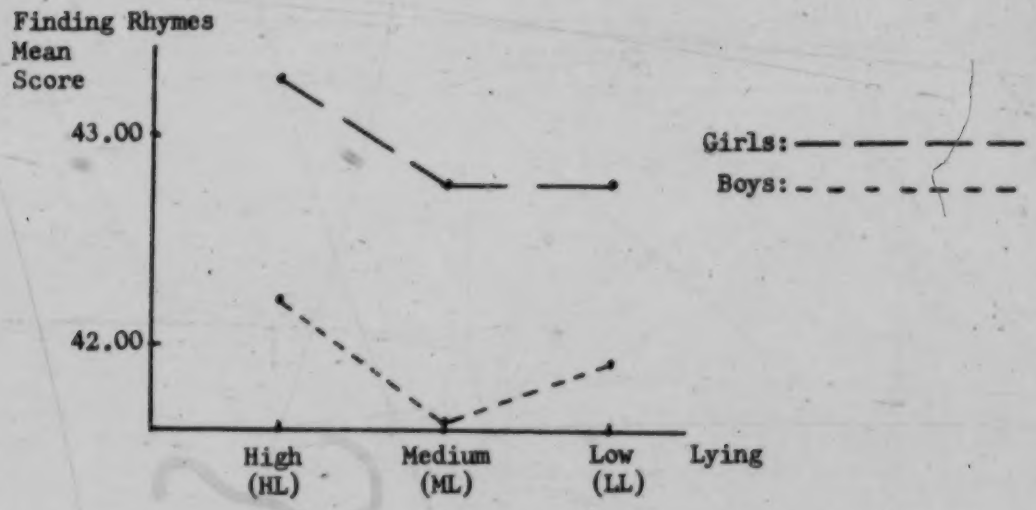
Homogeneity of variances:

$\chi^2 = 0.90$ df = 5 p = .97

Probability matrix for Scheffe multiple comparison of means:

	HL	ML
ML	.10	
LL	.16	.99

FIGURE XIII: GRAPH-LYING VERSUS EMLAT PART 3. (Finding Rhymes)



EMLAT Part 3. (Finding Rhymes)

Lying		Boys	N	Girls	N
High	(HL)	42.22	18	43.29	28
Medium	(ML)	41.63	27	42.79	19
Low	(LL)	41.94	31	42.79	14

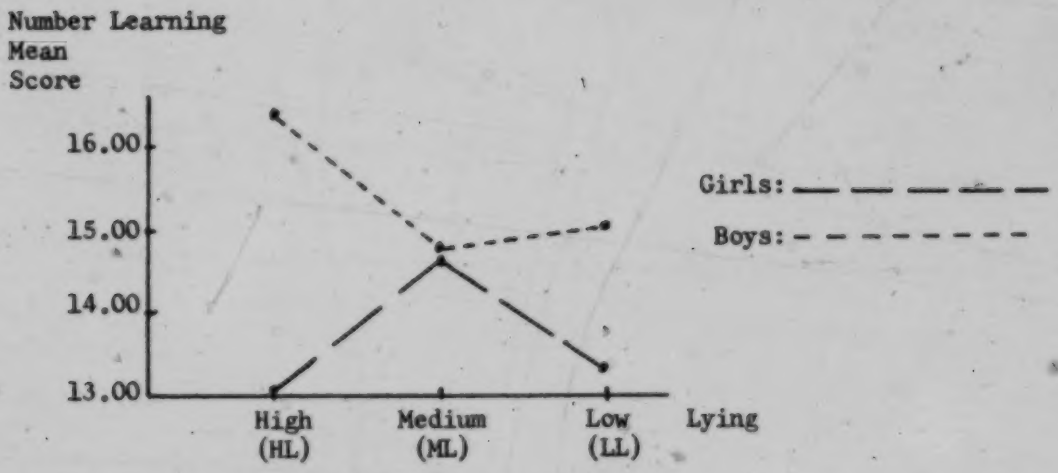
Homogeneity of variances:

$\chi^2 = 36.28$ df = 5 $p < .01$

Probability matrix for Scheffe multiple comparison of means:

	HL	ML
ML	.75	
LL	.87	.98

FIGURE XIV: GRAPH-LYING VERSUS EMLAT PART 4. (Number Learning)



EMLAT Part 4. (Number Learning)

Lying	Boys	N	Girls	N
High (HL)	16.39	18	13.04	28
Medium (ML)	14.78	27	14.63	19
Low (LL)	15.07	31	13.36	14

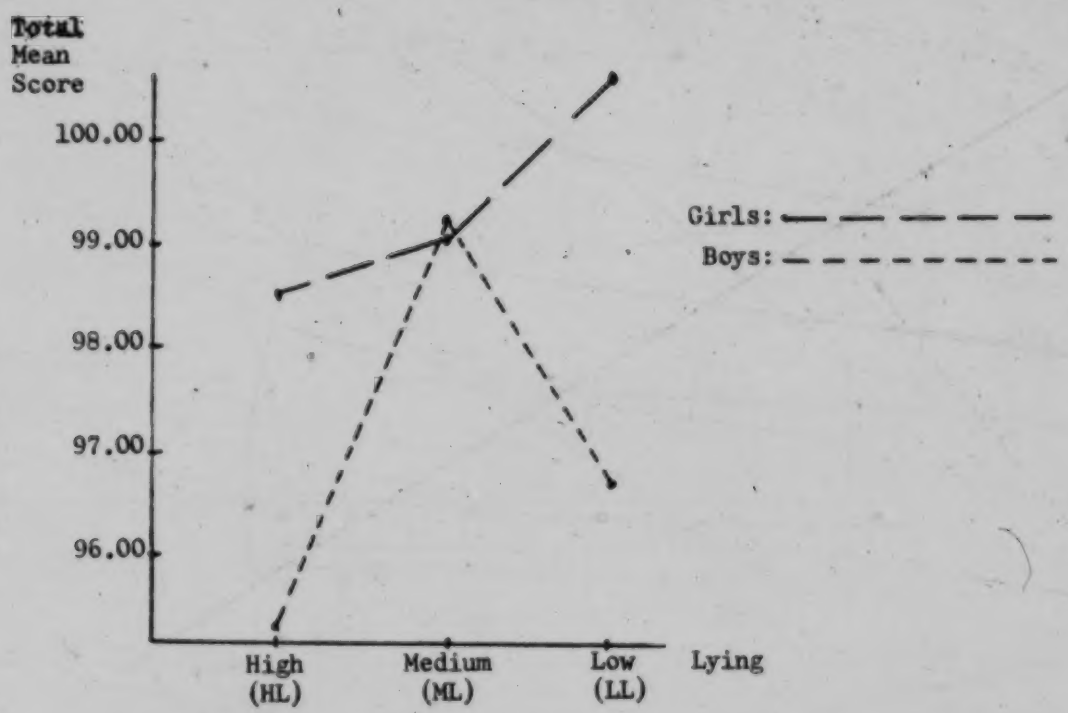
Homogeneity of variance:

$\chi^2 = 0.42$ df = 5 p = .99

Probability matrix for Scheffe multiple comparison of means:

	HL	ML
ML	.99	
LL	.96	.97

FIGURE XV : GRAPH - LYING VERSUS EMLAT TOTAL



EMLAT Total

Lying	Boys	N	Girls	N
High (HL)	95.33	18	98.50	28
Medium (ML)	99.26	27	99.05	19
Low (LL)	96.74	31	100.64	14

Homogeneity of variances :

$\chi^2 = 1.09$ df = 5 p = .96

Probability matrix for Scheffe multiple comparison of means:

	HL	ML
ML	.79	
LL	.87	.99

CHAPTER V

SUMMARY, IMPLICATIONS AND FURTHER RESEARCH

SUMMARY

The problem for this study was to find an explanation for the observed superiority of girls over boys in second-language classes, with particular emphasis on certain personality factors.

Seventy-six boys and 61 girls were given a test which measures extraversion, neuroticism and socially acceptable behaviour. The same group was also given a second-language aptitude test which measured their ability to associate sounds and symbols, their sensitivity to grammatical structure, their ability to hear speech sounds, and their auditory alertness and memory.

One-way analyses of variance were carried out to determine any statistically significant sex-differences on the three personality factors and the four second-language aptitude factors. The personality variables were then categorised in order to determine any significant multiple correlations of sex and personality categories with the four aptitude variables. The two-way analysis of variance carried out with these categories was also used to determine if the correlations obtained were, in fact, linear or curvilinear.

The computer programmes available in the University of Alberta's Division of Educational Research Services were used in the computations.

The results showed that no statistically significant differences were apparent between the sexes on the extraversion and neuroticism scores. Girls, however, were found to be significantly better than boys in their patterns of acceptable behaviour as measured by the lie-scale score.

No significant sex-differences were found in the over-all measure of second-language aptitude. In terms of perceiving the syntax of a language and in sound discrimination ability, however, girls obtained significantly higher scores than boys on these two subtests. It was concluded, therefore, that the apparent superiority of girls in second-language classes was due to the relatively greater importance of these two variables as perceived by second-language teachers in classroom situations.

The two-way analysis of variance yielded no significant inter-relationships for sex and extraversion or for sex and neuroticism. There was some evidence that medium extraverted Ss tend to have a worse ability to associate sounds with symbols and also to discriminate between sounds, than their high extraverted peers. This relationship was more striking for the girls than it was for the boys. The small numbers involved within the cells of the analysis, however, considerably weakens the reliability of such conclusions.

Significant relationships were also apparent for the sexes and their lie-scale scores with respect to their perception of syntax. Boys who scored high on the lie-scale did worse than those who scored in the medium range of the scale. Girls, on the other hand, were significantly different from boys in that their perception of sytax remained appreciably constant. Here again, however, the numbers in each cell warrant rechecking these findings with another, larger sample in order to determine the reliability of these findings.

TABLE XII: SUMMARY OF RESULTS

VARIABLE	BOYS > GIRLS	GIRLS > BOYS	p
Extraversion		x	.78
Neuroticism		x	.73
Lying (good behaviour)		x	.01*
Hidden Words		x	.43
Matching Words		x	.04*
Finding Rhymes		x	.04*
Number Learning	x		.25
EMLAT Total		x	.48
High Extraverts: Hidden Words		x	.83
Medium Extraverts: Hidden Words	x		.83
Low Extraverts: Hidden Words		x	.83
High Extraverts: Matching Words		x	.05*
Medium Extraverts: Matching Words		x	.05*
Low Extraverts: Matching Words		x	.05*
High Extraverts: Finding Rhymes		x	.19
Medium Extraverts: Finding Rhymes	x		.19
Low Extraverts: Finding Rhymes		x	.19
High Extraverts: Number Learning	x		.14*
Medium Extraverts: Number Learning	x		.14*
Low Extraverts: Number Learning	x		.14*
High Extraverts: EMLAT Total		x	.87
Medium Extraverts: EMLAT Total	x		.87
Low Extraverts: EMLAT Total		x	.87
High Neurotics: Hidden Words		x	.39
Medium Neurotics: Hidden Words		x	.39
Low Neurotics: Hidden Words	x		.39
High Neurotics: Matching Words		x	.04*
Medium Neurotics: Matching Words		x	.04*
Low Neurotics: Matching Words		x	.04*
High Neurotics: Finding Rhymes		x	.06*
Medium Neurotics: Finding Rhymes		x	.06*
Low Neurotics: Finding Rhymes		x	.06*
High Neurotics: Number Learning		x	.25
Medium Neurotics: Number Learning	x		.25
Low Neurotics: Number Learning	x		.25
High Neurotics: EMLAT Total		x	.46
Medium Neurotics: EMLAT Total		x	.46
Low Neurotics: EMLAT Total	x		.46
High Lying: Hidden Words		x	.35
Medium Lying: Hidden Words	x		.35
Low Lying: Hidden Words		x	.35
High Lying: Matching Words		x	.01*
Medium Lying: Matching Words	x		.01*
Low Lying: Matching Words		x	.01*
High Lying: Finding Rhymes		x	.09*
Medium Lying: Finding Rhymes		x	.09*
Low Lying: Finding Rhymes		x	.09*
High Lying: Number Learning	x		.25
Medium Lying: Number Learning	x		.25
Low Lying: Number Learning	x		.25
High Lying: EMLAT Total		x	.40
Medium Lying: EMLAT Total	x		.40
Low Lying: EMLAT Total		x	.40

IMPLICATIONS

The implications of this study may be broadly classified in terms of sex differences and personality, and in terms of sex-differences and second-language aptitudes.

For the first set of implications, the study suggests that behaviour problems should be carefully monitored by teachers so as to ensure optimum conditions for learning. Clearly, the role of parental discipline as well as the degree with which respect for standard norms of behaviour for a particular society and time is encouraged, affects a child's performance. The study implies that those who do follow these norms are in fact freer to develop their capabilities for learning. Besides Hall's (1951) statement that the higher extraversion of North Americans when compared to Europeans, for example, is a cause for the difficulty with which North Americans learn a second language, one could also make the point that the greater respect for the norms of society may also be a favourable point for the Non-American groups. Teachers, in their professional training in Universities, should perhaps be made aware of their unique position to emphasise to their future students, the hindrance which socially unacceptable behaviour patterns have on their academic progress.

The second set of implications would suggest a closer look at the suitability of a single approach for both sexes to second-language learning. The apparent deficiency of boys in their perception of syntax would suggest a remedial grammatical approach for boys so that they may develop such skills as a knowledge of syntax implies. The current audio-visual approaches would tend to favour the girls who would see the syntax involved in a structure more readily than the boys. These

audio-visual systems would also discriminate against the boys in that one of the primary assumptions of audio-visual courses is that sound discrimination is an important part of learning a second language. The study shows that boys are deficient in precisely this field. Language laboratory exercises appear to be more useful for boys than for girls, assuming, of course, that language laboratories are useful in developing the ability to discriminate between sounds. Here again, teacher education in the language area could take this into consideration when introducing the teachers of the future to this tool.

FOR FURTHER RESEARCH

For any statistical study, replication of the experiment is always advisable to substantiate the findings reported in the study.

The JEPI must be further evaluated in terms of the sex-related differences for E and N. The underlying reasons for the observed differences need to be further explored. The current ambiguities of the lie-scale's interpretation should also be studied.

The subtests of the EMLAT should be revised so as to separate effectively various aptitudes measured. As it stands, it is quite difficult to attribute an exclusive domain for the various facets of aptitude which each subtest is purported to measure. Although quite difficult to do without a better appreciation of the physiological and neurological processes involved; a way should be found to enable the subtests to be more meaningful in terms of remedial teaching in second-language classes.

More pedagogical research is needed to develop better programmes which take into account the fact that sex-differences may

exist in the processes of second language learning. More research would be usefull, for example in the specific field of sex-differences in syntax perception and development. The reasons which may lie at the root of the observed sex-differences in sound discrimination may also be usefully pursued in research projects. Scagliola's (1971) work shows that research is needed to accomodate sex-differences in curriculum material development for second-language courses.

Finally, more work needs to be done to determine the relationships of the variables dealt with in this study and other variables which are recognised as being important in second-language learning. Jones (1972) has demonstrated that in the field of attitudes, for example, sex-differences also play a significant role. Motivation, intelligence, social background and other variables undoubtedly exert their influence on this topic.

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APPENDIX A

JUNIOR EYSENCK PERSONALITY INVENTORY

QUESTION	RESPONSE	VARIABLE
1. Do you like plenty of excitement going on around you?	yes	extraversion
2. Do you often need kind friends to cheer you up?	yes	neuroticism
3. Do you nearly always have a quick answer when people talk to you?	yes	extraversion
4. Do you sometimes get cross?	no	lie
5. Are you moody?	yes	neuroticism
6. Would you rather be alone instead of meeting other children?	no	extraversion
7. Do ideas run through your head so that you cannot sleep?	yes	neuroticism
8. Do you always do as you are told at once?	yes	lie
9. Do you like practical jokes?	yes	extraversion
10. Do you ever feel "just miserable" for no good reason?	yes	neuroticism
11. Are you rather lively?	yes	extraversion
12. Have you ever broken any rules at school?	no	lie
13. Do lots of things annoy you?	yes	neuroticism
14. Do you like doing things where you have to act quickly?	yes	extraversion
15. Do you worry about awful things that might happen?	yes	neuroticism
16. Can you always keep every secret?	yes	lie
17. Can you get a party going?	yes	extraversion
18. Do you get thumping in your heart?	yes	neuroticism
19. When you make new friends do you usually make the first move?	yes	extraversion
20. Have you ever told a lie?	no	lie

QUESTION	RESPONSE	VARIABLE
21. Are you easily hurt when people find fault with you or the work you do?	yes	neuroticism
22. Do you like telling jokes or funny stories to your friends?	yes	extraversion
23. Do you often feel tired for no good reason?	yes	neuroticism
24. Do you always finish your homework before you play?	yes	lie
25. Are you usually happy and cheerful?	yes	extraversion
26. Are you touchy about some things?	yes	neuroticism
27. Do you like mixing with other children?	yes	extraversion
28. Do you say your prayers every night?	yes	lie
29. Do you have "dizzy spells"?	yes	neuroticism
30. Do you like playing pranks on others?	yes	extraversion
31. Do you often feel fed-up?	yes	neuroticism
32. Do you sometimes boast a little?	no	lie
33. Are you mostly quiet when you are with others?	no	extraversion
34. Do you sometimes get so restless that you cannot sit in a chair long?	yes	neuroticism
35. Do you often make up your mind to do things suddenly?	yes	extraversion
36. Are you always quiet in class, even when the teacher is out of the room?	yes	lie
37. Do you have many frightening dreams?	yes	neuroticism
38. Can you usually let yourself go and enjoy yourself ay a gay party?	yes	extraversion
39. Are your feelings rather hurt easily?	yes	neuroticism
40. Have you ever said anything bad or nasty about anyone?	no	lie
41. Would you call yourself happy-go-lucky?	yes	extraversion

QUESTION	RESPONSE	VARIABLE
42. Do you worry for a long while if you feel you have made a fool of yourself?	yes	neuroticism
43. Do you often like a rough and tumble game?	yes	extraversion
44. Do you always eat everything you are given at meals?	yes	lie
45. Do you find it very hard to take no for an answer?	yes	neuroticism
46. Do you like going out a lot?	yes	extraversion
47. Do you sometimes feel life is just not worth living?	yes	neuroticism
48. Have you ever been insulting to your parents?	no	lie
49. Do other people think of you as being very lively?	yes	extraversion
50. Does your mind often wander off when you are doing a job?	yes	neuroticism
51. Would you rather sit and watch than play at parties?	no	extraversion
52. Do you find it hard to get to sleep at nights because you are worrying about things?	yes	neuroticism
53. Do you usually feel fairly sure you can do the things you have to do?	yes	extraversion
54. Do you often feel lonely?	yes	neuroticism
55. Are you shy of speaking first when you meet new people?	no	extraversion
56. Do you often make up your mind when it is too late?	yes	neuroticism
57. When children shout at you, do you shout back?	yes	extraversion
58. Do you sometimes feel specially cheerful and other times sad without any good reason?	yes	neuroticism
59. Do you find it hard to really enjoy yourself at a lively party?	no	extraversion
60. Do you often get into trouble because you do things without thinking first?	yes	neuroticism

APPENDIX B

MODERN LANGUAGE APTITUDE TEST - ELEMENTARY

Part 1. (Hidden Words)

1. rivr	large stream of water hill	a jealous person a dog's name
2. nedl	a kind of plant something heavy	something used for sewing wise
3. ansr	true argue	illness reply
4. nikl	a bright light a five-cent coin	a small basket a sharp pain
5. midl	dirty blame	disturb in between
6. nif	a sharp tool a kind of paint	a part of the body a small animal
7. tn	park a number	a kind of sword soon
8. oshn	honest the sea	to shut tightly sticky
9. silns	brick box	wind quiet
10. ruf	strong wind a kind of wood	top of a house a large bug
11. rnj	shelter washcloth	a kind of fruit spy
12. nme	sheet of paper not happy	a kind of plant not a friend
13. egl	large bird a kind of food	unhappy upset
14. resnt	working hard never seen	to pick flowers not long ago
15. grosr	man who sells food a kind of wax	a kind of plant sharp tool
16. frit	flour fear	boiled simple

17. hrd	part of the body not soft	man who writes stories flat board
18. buflo	name of a month a kind of animal	a heavy board a kind of candy
19. ovn	place to bake bread paper for writing	something for cutting wood frozen water
20. kmfrt	empty silly	ease basket
21. lfnt	kind empty	brave large animal
22. pasnjr	partner farm	traveler a kind of shoe
23. salr	man who works on a ship easy to do	to use what is left over pay
24. nvit	furniture ask	jealous to help out
25. ne	a part of the leg a piece of clothing	something to eat a child's toy
26. pensl	a growing plant a hollow shell	something to write with a kind of cake
27. agre	breakfast food to arrive early	to have the same opinion sour taste
28. alrm	a signal of danger a person who hunts	a pipe that will bend all the same
29. atemt	a small bundle to tease	a group of trees to try
30. jrne	a person who commands not wide	a glass container a long trip

Part 2. (Matching Words)

1. A small BOY rang the bell.
   Our dog never bites the mailman.

2. The BLACK cat ran under the bed.
   In Africa the hot sun shines brightly.

3. Last summer my FATHER took me to the circus.
   Years ago, people lived in caves.

4. Peter WINDS his clock every night.
   In the summer the warm winds blow.

5. I cut my FINGER with a knife.
   Susan picked up her doll.

6. Give your dog WATER when he is thirsty.
   I know he tore the book on purpose.

7. ELEPHANTS like to eat peanuts.
   Gentle rain is good for flowers.

8. My brother FORGOT his lessons.
   The little mouse ran from the cat.

9. Children love to play in the COLD snow.
   Carrying bricks is hard work for me.

10. I always SHUT the door behind me.
    Three large dogs chased the poor cat.

11. Once upon a time, fierce PIRATES sailed the seas.
    The sudden storm blew down many trees.

12. Because they eat INSECTS, birds are helpful.
    Someone has stolen Ned's shiny new bicycle.

13. Alice PLAYS the piano very well.
    Little babies drink lots of milk.

14. Goldilocks slept in the LITTLE bear's bed.
    Mary is fond of chocolate milk.

15. The mother punished her naughty CHILD,
    George Washington chopped down a young tree.

16. Is your SISTER still sick?
    Bees make sweet honey from flowers.

17. The milkman brings us FRESH milk.
    Send Nancy a funny card on her birthday.

18. In bad weather, I always CARRY my umbrella.
    Mother sang a lullaby to the little baby.

19. The farmer's boy carelessly dropped the EGGS.
    Sarah opened the door slowly and peeked in.

20. The kind POLICEMAN helps all the children.
    My brother Frank sent the president a letter.

21. Do you like to sleep on a SOFT pillow?
    Hot soup tastes good when you are cold.

22. I tried to catch the FROG, but I couldn't.
    Please don't leave your hat on the table.

23. The dog was greedy, and he lost his BONE.
    The early bird gets the worm unless there's an earlier bird.

24. It doesn't take long to chop a tree if your axe is SHARP.
    Aunt Mary makes delicious pies so that we'll all be happy.

25. My father DRINKS hot coffee every morning.
    Tom ran fast and caught the ball.

26. The teacher had a FRIENDLY smile for everyone.
    We all laughed at the silly things Peter said.

27. Where did you buy the new GLOVES?
    We found the box under a table in the old barn.

28. HENRY tied a bell to the cat's collar.
    Will you be home in time for supper?

29. Helen WON the prize for the best flowers.
    After he got in the henhouse, the clever fox stole many chickens.

30. When winter comes the BIRDS fly south.
    Do men still believe the world is flat?

Part 3. (Finding Rhymes)

1. DOOR	car	four	mayor	our
2. BEEF	calf	if	knife	leaf
3. PIE	may	pea	sky	three
4. MAKE	break	like	leak	peck
5. RAIN	dawn	Jane	man	mine
6. ALL	fail	meal	owl	wall
7. FACE	case	fast	pass	pays
8. MIX	kicks	lakes	likes	talks
9. LOW	allow	blow	cough	flaw
10. SAY	fee	my	tie	tray
11. MINE	loan	Maine	mean	sign
12. MEND	cleaned	friend	kind	pinned

13. YOU	few	how	law	toe
14. DASH	brush	push	splash	wash
15. HOLE	pool	roll	tall	towel
16. PULL	roll	dull	school	wool
17. PRINCE	lines	mints	paints	pins
18. NAME	aim	farm	rhyme	term
19. SHOOT	coat	foot	fruit	got
20. MAID	feed	grade	ride	sad
21. SCHOOL	doll	coil	rule	whole
22. ROSE	froze	grease	mouse	toss
23. PASS	base	cross	gas	lace
24. FIST	kissed	laced	last	taste
25. BONE	lawn	moon	one	own
26. PALE	pal	real	sail	tall
27. WARM	arm	form	lamb	term
28. BEST	feast	fist	guest	last
29. CLIMB	lamb	main	tame	time
30. COAST	lost	lowest	most	tossed
31. HUM	dumb	fume	room	whom
32. TOUGH	dog	off	row	stuff
33. FOLK	elk	oak	talk	took
34. BEAD	mad	need	red	ride
35. COW	few	low	thou	though
36. PILLAR	cellar	seller	tailor	thriller
37. OF	loaf	love	move	off
38. FIRE	choir	here	more	pear
39. KNEES	geese	mice	rays	these

40. AFTER	daughter	fighter	<u>laughter</u>	mother
41. FOOD	cold	good	<u>rude</u>	should
42. EIGHT	bite	fight	<u>late</u>	meet
43. COURSE	floors	<u>force</u>	nurse	worse
44. SIZE	mice	piece	raise	<u>wise</u>
45. PUT	<u>foot</u>	hut	mute	shoot

Part 4. (Number Learning)

a. 23	b. 2	c. 11	d. 33	e. 21
f. 3	g. 12	h. 30	i. 22	j. 1
k. 31	l. 20	m. 32	n. 10	o. 13
p. 33	q. 21	r. 12	s. 22	t. 13
u. 32	v. 23	w. 11	x. 20	y. 2

APPENDIX C

RAW SCORES AND COMPUTER INPUT DATA

Key:

A	:	Output sequence number	
B	:	Student Identification Number	
C	:	Sex of student	(1 = boy ; 2 = girl)
D	:	Extraversion category	(1 = high ; 2 = medium ; 3 = low)
E	:	Neuroticism category	(1 = high ; 2 = medium ; 3 = low)
F	:	Lying category	(1 = high ; 2 = medium ; 3 = low)
G	:	Extraversion score	(maximum = 24)
H	:	Neuroticism score	(maximum = 24)
I	:	Lying score	(maximum = 12)
J	:	Hidden Words score	(maximum = 30)
K	:	Matching Words score	(maximum = 30)
L	:	Finding Rhymes score	(maximum = 45)
M	:	Number Learning score	(maximum = 25)
N	:	Total EMAT score	(J + K + L + M ; maximum = 130)

A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	1361231					191105	211044C3078						
2	0021222					161201	27174121106						
3	0031212					161801	282145C61C3						
4	0041313					112200	140645040C6						
5	0051313					152000	172143000B1						
6	0061221					201103	22084313086						
7	0071213					181600	25154317103						
8	0121221					201405	12203901078						
9	0131133					211CC6	25164425113						
10	0151223					191400	23194213097						
11	0181132					200403	30204505100						
12	0201313					151901	07063602051						
13	0211112					201802	261743C1089						
14	0231213					191701	23114303080						
15	0241131					220704	28104521112						
16	0261321					161303	30094224105						
17	0321221					181304	25194421109						
18	0331312					151702	29244523121						
19	0341223					171101	24104225101						
20	0351132					220301	30244424122						

A	B C D E F	G,H,I,	J,K,L,M,N
21	0371213	172101	22134220097
22	0381132	201003	22193615092
23	0401231	160905	28104524107
24	0411322	131202	19103103063
25	0421231	190604	16104005071
26	0451132	220402	26204325114
27	0461223	201401	29153910093
28	0471331	130203	25154322105
29	0481232	170802	22133925099
30	0491213	191800	28194500092
31	0501331	160507	20064319088
32	0521231	170207	24104424106
33	0541312	161803	27164413100
34	0561323	161501	17193804078
35	0581223	181201	23244402093
36	0611223	191601	25133715090
37	0621213	172001	18113122082
38	0641232	181002	27194422112
39	0681122	211003	28134406093
40	0711222	201202	26204302091
41	0721313	162000	25124418099
42	0751322	141202	28214325117
43	0781123	211401	26174219104
44	0791132	210702	26144410094
45	0811331	110809	30194124114
46	0831131	241003	18134115087
47	0841223	191300	27234523118
48	0851333	111000	29224320114
49	0861212	191803	23184320104
50	0871123	221601	26194524114
51	0901233	200901	22153712098
52	0911231	180908	22173805082
53	0921313	142201	27124024103
54	0931332	161103	25154421105
55	0961212	172303	24134220099
56	1001112	201902	23164213094
57	1011111	202004	21104322096
58	1031223	191401	23164309091
59	1041121	211103	21073914081
60	1061322	161502	23204524112
61	1071113	232301	26154115098
62	1081213	171801	23214422110
63	1101311	152104	29214313106
64	1111332	161003	29284509111
65	1131313	151701	25154423107
66	1141323	141501	27184425114
67	1151222	181602	27192711064
68	1171233	131101	30224525122
69	1181223	191200	26184404092
70	1201122	211203	23154413095
71	1231212	172002	26154419104
72	1261232	190602	29244515117
73	1291331	100604	27164325111
74	1321133	210300	25174121104
75	1331123	211001	22224221107
76	1351312	151903	21182404002

A	B,C,D,E,F	G,H,I	J,K,L,M,N
77	0012131	200305	26244404C98
78	0082133	220600	291644C8C97
79	0092212	201702	28174513103
80	0102212	181701	20223110C83
81	0112311	111005	14084101064
82	0142131	210905	17194123100
83	0162132	210703	29254516115
84	0172231	191103	29234504101
85	0192321	131304	25174314099
86	0222333	121001	24264516111
87	0252232	201002	11064414075
88	0272322	161302	17093900065
89	0282112	212101	13204422099
90	0292131	210505	28264325122
91	0302231	180308	22174014093
92	0312311	141904	27234319112
93	0362122	221402	21174314095
94	0392111	221805	27254521118
95	0432312	161702	30264520121
96	0442233	161100	29234420116
97	0512323	161200	29264521121
98	0532313	151800	26234322114
99	0552123	221300	26224412104
100	0572222	181603	25184402089
101	0592111	201707	24184319104
102	0602132	210602	23164105085
103	0632231	160607	28244417113
104	0652321	151210	27154401087
105	0662111	201704	30184508101
106	0672121	221403	25084207082
107	0692321	101508	24134100078
108	0702112	211502	25164407092
109	0732121	201507	26124100079
110	0742122	211302	27194325114
111	0762112	212002	28144421107
112	0772211	171604	14214424103
113	0802313	121901	25174517104
114	0822233	181101	28174312100
115	0882111	211903	22234017102
116	0892213	181801	26164213097
117	0942321	141403	29234425121
118	0952113	211901	29124525111
119	0972131	220904	29124400085
120	0982322	161402	28214425118
121	0992311	152307	23154519106
122	1022113	201700	29234500097
123	1052133	201101	25174421107
124	1092331	150905	27154522109
125	1122122	221502	29204524118
126	1162131	200304	24104314091
127	1192311	101804	23134503084
128	1212321	121605	25194406094
129	1222322	161602	27174323113
130	1242131	210904	20114419094
131	1252322	161502	28214320112
132	1272312	122303	22104113086
133	1282331	160506	27184425114
134	1302132	201002	25214504095
135	1312121	201204	27184514104
136	1342213	171701	19154100075
137	1372223	171500	14122900055

APPENDIX D

STANDARDISATION DATA FOR JEPI AND EMLAT *

Junior Eysenck Personality Inventory

	Extraversion (E)	Neuroticism (N)	Lying (L)
	M E A N S		
Boys	17.58(17.70)	11.02(13.24)	4.14(2.18)
Girls	17.35(17.85)	12.49(13.54)	4.44(3.10)
	STANDARD DEVIATION		
Boys	3.50(2.99)	5.06(5.35)	2.76(1.87)
Girls	3.51(3.41)	5.19(4.92)	2.86(2.30)
	CORRELATIONS		
Boys(N)	-.18(-.12)		
Boys(L)	-.07(-.09)	-.35(-.36)	
Girls(N)	-.16(-.23)		
Girls(L)	-.02(-.20)	-.22(-.21)	

Modern Language Aptitude Test - Elementary

	Hidden Words (1.)	Matching Words (2.)	Finding Rhymes (3.)	Number Learning (4.)
	M E A N S			
Boys	23.8(24.00)	19.2(16.13)	41.2(41.89)	16.7(15.28)
Girls	24.7(24.64)	21.4(17.90)	42.2(43.02)	16.7(13.61)
	STANDARD DEVIATION			
Boys	4.0(4.75)	5.6(4.84)	5.5(3.68)	7.0(8.25)
Girls	3.8(4.58)	4.8(5.03)	6.0(2.84)	6.6(8.42)
	CORRELATIONS			
Boys(2.)	.58(.41)			
Boys(3.)	.64(.58)	.60(.32)		
Boys(4.)	.50(.39)	.51(.09)	.41(.23)	
Girls(2.)	.56(.43)			
Girls(3.)	.63(.49)	.59(.24)		
Girls(4.)	.41(.17)	.40(.40)	.39(.30)	

* Figures in brackets refer to data obtained from the Thesis sample.